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Middle-Late Triassic metamorphism of the Guajira Arch-basement: Insights from zircon U-Pb and Lu-Hf systematics

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Abstract

The Guajira Arch is located in the northernmost portion of South America and holds the record of several stages of magmatism and metamorphism. We performed LA-ICP-MS U-Pb zircon geochronology coupled with Lu-Hf isotope geochemistry on 11 samples from a high-grade gneissic basement hosting interleaved complexes of younger meta-granitoids and meta-sediments to unravel its tectono-metamorphic evolution. The oldest rocks correspond to a Rodinia-type basement at ca. 1100-880 Ma, affected by mafic magmatism during the Permian at ca. 272 Ma, anatexis during the Carnian at ca. 230 Ma, updoming and the formation of an extensional detachment fault during the Norian at ca. 224 Ma concluding with Jurassic magmatism since ca. 190 Ma. Trace element geochemistry shows that Triassic zircons are depleted in HREE and yield lower Th/U ratios than Jurassic zircons enriched both in HREE, Yb, and Y. Hf systematics indicates a Triassic to Jurassic evolution towards more radiogenic compositions. The lithological associations, structural setting, U-Pb ages, and Hf isotope geochemistry of the Triassic-Jurassic rocks at the Guajira Arch characterize an active margin setting of a hot orogenic belt in NW-Gondwana, comprising the Central Cordillera of Colombia, the Santa Marta Massif, the Merida Andes, the Perijá Range, the Santander Massif and the para-autochthonous terranes south of the Ouachita-Marathon Suture (Oaxaquia, Acatlán, and Maya), and thus vindicate the existence of a conjugate margin with Laurentia until the Late Triassic, preceding the breakup of western Pangaea. The Triassic anatexites and Jurassic granitoids from the Guajira Arch yield Proterozoic Hf T_{DMi} ages which are indistinguishable from the autochthonous Proterozoic basement and thus render an allochthonous origin by terrane accretion highly improbable. Instead, these data point to melting of the continental crust by the incorporation of primitive material reflecting a two-stage process at the boundary of a large underlying mantle convection cell (i) Triassic slab steepening, subduction arrest, updoming anatexis at ca. 230-223 Ma and (ii) Early Jurassic arc-magmatism at ca. 190-165 Ma due renewed convergence. Furthermore, we propose that the structural setting, lithology, and isotope geochemistry of the Guajira Arch units, fit into the style of a cordilleran core-complex emplaced in a roll-back extensional setting preceding Pangaea break-up.

Keywords: *Guajira Arch, Geochronology, Peri-Gondwana terranes, amphibolite facies metamorphism, Pangaea.*

1. INTRODUCTION

The Late Paleozoic-Early Mesozoic evolution of western Pangaea continental margin was governed by subduction geodynamics, typical of cordilleran orogenic systems (Collins and Richards, 2008; Decelles et al., 2009; Collins et al., 2011). This evolution involves a plate setting prompted by the reorganization of a far stress field, intermittent arc-magmatism, and metamorphism linked to alternating periods of extension and compression, changes in slab geometries and convergence rates, the accretion of para-autochthonous blocks, and their corresponding feedbacks (Pindell, 1985; Murphy et al., 2004; Meert and Lieberman, 2008; Pindell and Kennan, 2009; Nance et al., 2012; Spikings et al., 2015; van der Lelij et al., 2016b; Cardona et al., 2016).

A prime challenge in such a geodynamic context consists of unravelling multiple magmatic-arc building stages and associated metamorphic events (Zuluaga, 2015; Montes et al., 2019; Zuluaga and Lopez, 2019). In this work, we focus on a regional Late Paleozoic - Early Mesozoic first contractional and then extensional orogenic evolution that is widely documented along the Northern Andean continental margin (Fig. 1A; Vinasco et al., 2006a; Cardona et al., 2010b; Villagómez et al., 2011; Van Der Lelij, 2013; Cochrane et al., 2014a; Martens et al., 2014; van der Lelij et al., 2016b; Zuluaga et al., 2017; Spikings and Paul, 2019; Tazzo-Rangel et al., 2019).

During the Permian to Early-Triassic assembly of Pangaea, north-western Gondwana basement inliers (i.e., Oaxaquia block, southern Chiapas massif, Acatlán and Xolapa complexes, and the Tahamí terrane) were juxtaposed into a complex array and recorded, by their position at the active continental margin, the Panthalassian subduction (Weber et al., 2007; van der Lelij et al., 2016b; Riel et al., 2018), in addition to the far-reaching collisional events related to the Alleghanian orogeny along the Ouachita-Marathon Suture (Pindell, 1985; Sacks and Secor,

1990; Weber et al., 2007; Murphy et al., 2010; Nance et al., 2012; van der Lelij et al., 2016b; Spikings and Paul, 2019; Coombs et al., 2020). The Late Paleozoic-Triassic tectono-metamorphic events during Pangaea assembly were followed by extensive magmatic arc build-up that culminated in rifting during Jurassic Pangaea break-up (Bayona et al., 2006; Pindell and Kennan, 2009; Cochrane et al., 2014a, 2014b; Zuluaga, 2015; Spikings et al., 2015; van der Lelij et al., 2016b, 2016a; Quandt et al., 2018).

Figure 1. A) Plate tectonic overview of Northern South America, the Antilles, and Central America, showing in black the Proterozoic basement exposures of the Northern Andes and part of the Chortis block (adapted from Luzieux et al., 2006; Veloza et al., 2012; Weber et al., 2018; Vallejo et al., 2019; Tazzo-Rangel et al., 2019), black square encloses mapped area shown in B) Regional geology and new field mapping (this study) of the NW-Maracaibo block, the Guajira Peninsula, the Santa Marta Massif and the Perjá Range. LMV—Magdalena –valley, CRB—Cesar-Rancheria Basin, AgF—Aguja Fault, CeF—Cerrejón Fault, CuF—Cuisa Fault, FoF—Florín Fault, OcF—Oca Fault. OhF—Orihueca Fault, OrF—Ororio Fault, PeF—Perija Fault, SaF—Santa Marta Fault, SeF—Sevilla Fault, TiF—El Tigre Fault (compiled from Tschanz et al., 1969, 1974; Irving, 1972, 1975; Kellogg, 1984; Colmenares, 2007, and new mapping from this study).

At the northernmost Andes, the Guajira Peninsula (Fig. 1B) consists of two well-defined domains. The Baja Guajira southern lowlands expose a Cenozoic basin fill (Irving, 1975), whereas the hilly/mountainous north-eastern part is subdivided among the Macuira, Jarara, Simarua, and Cosinas ranges (Figs. 1-2). Along these four ranges, an ENE-WSW trending high-grade basement inlier named the Guajira Arch is mantled by sedimentary rocks, low-to medium-grade meta-pelites, intruded by several igneous and meta-igneous suites (Fig. 2; MacDonald, 1964; Lockwood, 1965; Alvares, 1967). The Macuira, Jarara, and Simarua ranges are separated by localized basins infilled by Oligocene-Pliocene sedimentary rocks (Fig. 2). The latter most likely originated by transtensional tectonics during Cenozoic transient stages of accretion of the Caribbean plate (Kellogg, 1984; Gómez and Burke, 2001; Quintero, 2017).

The paleogeographic setting of the Guajira Arch concerning its position along the continental margin of Gondwana has been questioned (Bayona et al., 2019), and different hypotheses heralding an autochthonous (Bartok et al., 2015), para-autochthonous (Nova et al., 2019), or allochthonous origin (Cediel et al., 2019; Colmenares et al., 2019) are discussed. These divergent interpretations were based on stratigraphy (Bartok et al., 2015), detrital zircon geochronology, and paleomagnetic data obtained from Mesozoic volcanic suites and platform sedimentary rocks (MacDonald and Opdyke, 1972; Bayona et al., 2006; Nova et al., 2019). However, isotopic data from this basement inlier to support such diverse models remains scarce, making it difficult to discern the participation of primitive/juvenile crustal sources in magma generation and its late detrital reworking. The collection of new geochemical-isotopic data is crucial for establishing which of the invoked processes, as terrane migration or sediment transferring were dominant during Early Mesozoic times. Furthermore, a unifying synthesis that integrates deformation phases and metamorphic events based on radiometric ages of crystallization and cooling events for basement and cover altogether has not been elaborated so

far (MacDonald, 1964; MacDonald and Opdyke, 1972; Cordani et al., 2005; Weber et al., 2009, 2010; Cardona et al., 2010a, 2014; López and Zuluaga, 2012).

In this contribution, we integrated field mapping with zircon U-Pb geochronology, Lu-Hf isotopic, and trace element compositions on representative key samples of the various lithologies from the Guajira Arch, in order to: 1) examine the possible distinction between a Proterozoic high-grade metamorphic basement and overlying younger meta-sediments; 2) to discuss the geochronological and isotopic affinity of the Guajira Arch basement concerning the Proterozoic Gondwanan continental realm and other para-autochthonous terranes; 3) to highlight the importance of a Late Paleozoic-Early Mesozoic tectono-metamorphic event, comprising the structural evolution of the continental margin; and finally, 4) to elucidate the geodynamic significance of the onset of Jurassic arc-magmatism.

Our results deliver new geochronological and isotopic constraints on the Proterozoic and Permo-Jurassic tectono-metamorphic events that affected this part of the western Pangaea realm and give insight into the evolution of this highly remobilized crustal section in a geodynamic context.

2. GEOLOGICAL SETTING

The Guajira Peninsula is located at about 12°N and constitutes the northernmost extension of the Andes (Figs 1-2). At the north-eastern part of the peninsula, a high-grade basement inlier named the Guajira Arch (Fig. 2) is covered at its NW-SE flanks by low-to-medium grade metasediments and sedimentary rocks of Jurassic to Late Cretaceous age (Renz, 1960; Alvares, 1967). Towards the south, the Cosinas Trough (Fig. 2) sedimentary units are juxtaposed to granodiorites, rhyodacites, and overlying volcanoclastic deposits remnants of a Jurassic magmatic arc (Rollins, 1965; Alvares, 1967; Zuluaga et al., 2015).

Figure 2. Detailed geological map of the Guajira Arch (SNSM) with cross-sections A-A' Jarara range and B-B' Macuira range (Fig. 3). Including sampling sites and U-Pb ages obtained in this study, modified from Irving, (1972) and new data (this study). Uray Gneiss samples (AVO-3, AVO-6), Jojoncito Gneiss sample (JOJON-1), Siapana Granodiorite (SIAP-1), Atuschón gneiss sample (Zu-6), and Ipapure Rhyodacite sample (PAR-260) compiled from Cardona et al. (2006); Zuluaga et al. (2015); Baquero et al. (2015), and Weber et al. (2010). A detailed map of the Uray gneiss and Jarara Formation contact is framed in figure 5. A stratigraphic section in figure 7 is indicated.

The Meso-Neoproterozoic basement of high-grade amphibolite to granulite facies units comprises the Macuira schists, Jaturuhu, Atuschón, and Jojoncito gneisses (Fig. 2; Radelli, 1962; MacDonald, 1964; Lockwood, 1965; Alvares, 1967; Irving, 1972; Cordani et al., 2005). The Atuschón and Jojoncito granitic gneisses yield zircon inherited core ages of 1550-1200 Ma. Metamorphism is dated at ca. 1028.7 Ma for the Atuschón Gneiss, whereas the Jojoncito Gneiss discloses a rim recrystallization age of ca. 916 Ma (Cordani et al., 2005; Baquero et al., 2015), bracketing a Late Mesoproterozoic-Early Neoproterozoic event. Currently, there are not available zircon U-Pb ages from the Macuira schists, yet an Sm/Nd model age (T_{DM}) of =1.45 Ga obtained from a muscovite schist hint to a Mesoproterozoic crustal source (Cardona et al., 2006).

In contrast, available Ar-Ar ages in amphibole may indicate a Mesozoic thermal event at ca. 200-100 Ma; however, these ages are highly discordant and should be treated carefully as they could also reflect alteration, partial resetting, slow cooling, Ar excess, recoil, or recrystallization (MacDonald, 1964; MacDonald and Opdyke, 1972; Cardona et al., 2006). The Meso-Proterozoic granulite facies basement exposures are mantled by Late Paleozoic-Triassic amphibolite facies mylonitic meta-granitoids, amphibolites, and paraschists named Uray Gneiss (Fig. 5; Lockwood, 1965; Alvares, 1967; Weber et al., 2010). Leucocratic units from the latter yield a Middle Triassic age (ca. 245 Ma; AVO-3, AVO-6 Fig. 3; Weber et al., 2010).

At the Jarara Range, the amphibolite facies mylonites from the Uray Gneiss are overlain in a tectonic contact at the NW by the greenschists facies meta-sediments of the Jarara Formation (Figs. 2-3). The Jarara Formation sets in with a basal meta-conglomerate level superseded by muddy to siliciclastic meta-sediments, with sporadic marble seams. At its middle part, bryozoans indicate an Upper Cretaceous age. These marine sedimentary rocks are superseded by mafic meta-volcanic rocks and felsic to intermediate meta-tuffs (Lockwood, 1965). At its top, the Jarara Formation is thrust by the Etapa Complex by the N-dipping Ororio fault (Figs. 2-3). This suite contains blocks of strongly serpentinized meta-ultramafic and meta-mafic rocks, embedded in a meta-pelitic matrix containing submarine lava flows and mafic meta-tuffs, glaucophane schists, and eclogite blocks, interpreted as a subduction channel (Medina Avellaneda, 2009). Paleogene conglomerates fringing the Jarara range contain blocks of eclogites derived from the Etapa Complex (Weber et al., 2010).

The Siapana granodiorite (Figs. 2 & 3) intruded the Macaira schists at ca. 167 Ma in a continental arc setting, and magma genesis entailed significant crustal contribution considering the Sm/Nd model age (T_{DM}) of = 1.47 Ga (Cardona et al., 2006, 2014). Jurassic arc build-up led to thermal metamorphism and, ultimately, to basement exhumation before the deposition of the

Cretaceous successions as evidenced by zircon provenance and fission-track data from the Cosinas Group, indicating sourcing from Jurassic plutons and Proterozoic basement ca. 154 Ma (Radelli, 1962b; MacDonald, 1964; García-Gonzales et al., 2010; Nova et al., 2019), implying that some of the Jurassic plutons had to be exposed at the time of deposition of these units.

Figure 3. Cross-sections A-A' and B-B' from the Jarara and Macuira ranges, in which a Late Cretaceous accretionary prism obducts the metamorphic Proterozoic-Triassic core. Mylonites separate the high-grade Triassic anatectites from a low-grade metasedimentary cover. Sub-vertical thrusts at the metamorphic core separate metasedimentary imbrications from the Proterozoic basement and maybe equivalent to crystalline nappes that overlay the Alas Complex metasediments. See cross-section location in Figure 2. AIF: Alas fault, IcF: Ichipa fault, ItF: Itujuru fault, OrF: Oriorio fault, YaF: Yaurama fault.

During the Late Cretaceous-Paleogene, associated platform sequences of the Jarara Formation and the Etpana Complex were partially obducted onto the continental margin as the convergence between the Caribbean plate and continental South America was increased (Lockwood, 1971; Weber et al., 2010, 2011). By Eocene times, the subduction gradually ceased as the convergence of the Caribbean plate against the continental margin of NW South America became oblique (Fig. 3; Lockwood, 1971; García-Casco et al., 2008; Cardona et al., 2011, 2014; Montes et al., 2019; Bustamante et al., 2021). The emplacement of the Parashi stock has

occurred under a transtensional regime that affected the upper plate, causing syn-kinematic deformation of the Jarara Formation, Etpana complex, and Parashi stock (Bustamante et al., 2021).

The east-trending right-lateral Cuisa fault activity (Fig. 2), which dissects the Guajira Arch, is recorded at least since the Oligocene by the Siamana Formation deposits (Renz, 1960; Gómez and Burke, 2001; Vence, 2008; García-Gonzales et al., 2010; Zapata et al., 2010; Quintero, 2017). Dextral transtensional structures as the Cuisa and Oca faults (Figs. 1-2) remained active during the Neogene, coeval to exhumation and relief building (Gómez and Burke, 2001; Cardona et al., 2011; Bustamante et al., 2021 Figs. 1-2). The strain was transferred from the Caribbean plate to the continental margin through clockwise block rotation (MacDonald and Opdyke, 1972; Bayona et al., 2006, 2011, 2013; Montes et al., 2010; Zapata et al., 2014; Cardona et al., 2018).

This process disrupted the otherwise continuous continental margin into Proterozoic inliers separated by pull-apart basins, for instance, the Santa Marta Massif and Guajira Arch separated by the Baja Guajira basin (Alvares, 1967; Irving, 1975; Macellari, 1995; Montes et al., 2010, 2019; Zapata et al., 2014; Londono et al., 2015; Piraquive et al., 2018).

3. METHODS

Samples were crushed and zircons extracted following the standard procedures (e.g., Mange and Maurer 1992) at the Colombian Geological Survey (SGC) and Universidad Nacional de Colombia facilities. Lithium polytungstate (2.89 g/cm^3) and Methylene iodide ($d = 3.32 \text{ g/cm}^3$) were used for density separation out of the sieved 400-63 μm fraction. Zircon grains from the heavy mineral concentrates were randomly selected by pipette and then hand-picked. After mounting in epoxy, grains were abraded to a sub-equatorial section and polished. Zircon

cathodoluminescence (CL) imaging was carried out using a Vega ©Tescan MV2300VP SEM at the Institute of Geochemistry and Petrology of the (ETHZ) at Zurich, Switzerland, and at the Colombian Geological Survey (SGC) using the JEOL JSM-IT300LV SEM, with a MiniCL Gatan to observe the internal structures of the crystals.

U–Pb geochronology and *in-situ* trace element composition of zircons were performed through laser ablation inductively coupled mass spectrometry (LA-ICP-MS) at both the ETHZ and SGC facilities. Zircon Lu-Hf isotopic compositions were measured by laser ablation, multi-collector inductively coupled plasma mass spectrometry (LA-MC-ICP-MS) at ETHZ. Lu-Hf results were plotted using the visual and statistical approach described by Andersen et al. (2018). The detailed analytical parameters and specifications of the methods and procedures are described in Appendix 1.

4. RESULTS

Sample location and lithology are shown in Table 1 and figures 2-7. Zircons detailed CL morphology, Th/U ratio, and Y content are presented in Table 2. Cathodoluminescence imagery, Concordia plots, and trace element geochemistry are plotted in figures 8-14. The complete datasets of U-Pb geochronological results are compiled in Table A1, trace element compositions in table A2, and Lu-Hf isotopic data in table A3.

4.1 Sample description, field relationships, and petrography

This section describes our new findings regarding the geological mapping of the units that compose the Guajira Arch, emphasizing the field relations and petrography of the Uray Gneiss and Jarara Formation at the Jarara Range. Our results highlight the stratigraphic and structural relations of a gneissic dome mantled by meta-sediments. Moreover, we briefly discuss

the high-amphibolite to granulite-facies Proterozoic inliers of the Guajira Arch cropping out in the Simarua and Macuira ranges, respectively analyzed in this study.

Proterozoic high-grade basement

The Guajira Arch backbone comprises high-amphibolite-to granulite facies units that form gneiss domes. Multiple lithological varieties have been recognized, and several units have been named as the Jojoncito Gneiss, Jaturuhu Gneiss, Macuira Schists, showing rather complex structural and stratigraphic relationships. It has recently been proposed to unify the Guajira Arch metamorphic units under the Macuira Gneiss definition (Lopez et al., 2014). However, in this work, we based our cartographic synthesis and followed the nomenclature originally proposed by Radelli (1962b), MacDonald (1964), Lockwood (1965), Alvares (1967), and Irving (1972). As will be discussed further in section 4.2, the division of the Proterozoic units of the Guajira Arch is also supported by new geochronological data.

Jaturuhu gneiss

In the Simarua range, we followed the Jaturuhu Gneiss definition posed by Alvares (1967), which corresponds with the description of heterogeneous migmatites given by Radelli (1962b). The Jaturuhu gneiss displays stromatic migmatitic segregations composed of feldspar with mesoperthite intergrowths, microcline, and quartz neosome, whereas the melanosome is composed of hornblende garnet and biotite.

From this unit, we collected two samples consisting of a mylonitic quartz-feldspathic augen-gneiss rich in biotite, muscovite, and garnet located close to the contact with the overlying Jarara Formation (sample B-245; Fig. 3, 4A) and an amphibolite melanosome in the vicinity of the Cuisa fault (sample C-172).

Figure 4. Field photographs of samples from the Guajira Arch metamorphic units analyzed in this study A) Quartz-feldspathic gneiss with augen texture (B-245, Jaturuhu Gneiss); B) Quartz-feldspathic gneiss with granoblastic texture (B-235, Jojoncito Gneiss); C) Felsic granulite (G-95, Jojoncito Gneiss); D) Folded structured metatexite (GC-061, Macuira Schists); E) Amphibole-epidote mylonitic schist (GC-021, Ug1; Uray Gneiss); F) Uray Garnet-amphibolite gneiss, (G-52D, Ug2; Uray Gneiss); G) Staurolite-biotite-garnet mylonite (G-54, Ug3; Uray Gneiss); H) Leucocratic dike Qtz+Pl+Ms (G-52A, Siapana Granodiorite); I) Quartz-muscovite protomylonitic meta-conglomerate (G-55B, Jf1; Jarara Formation).

Jojoncito gneiss

The Jojoncito gneiss is an elongated NE trending body in the eastern part of the Simarua range (Radelli, 1962a; Alvares, 1967; Cordani et al., 2005). Two samples were collected from; a granulite-facies quartz-feldspathic gneiss (sample B-235; Fig. 4B) and a felsic granulite (sample G-95; Fig. 4C). This body is hosted within the Jaturuhu gneiss, seemingly intrusive with the surrounding schists and gneisses from the Jaturuhu gneiss (Alvares, 1967). Its aspect is typically a massive white pinkish to cream color granitic gneiss, with textures that vary from strongly foliated to locally granoblastic, characterized by elongated and stretched, purplish-bluish, or smoky quartz within a K-feldspar and plagioclase matrix.

Macuira schists

We followed the definition of Macuira Schists by MacDonald (1964) for a suite of schists and migmatites outcropping in the Macuira and Jarara Ranges (Fig. 2-3), named by Radelli (1962b) as homogeneous migmatites or Macuira Series, characterized by folded metatexites, fine-grained biotite-muscovite, quartz-feldspathic schists, hornblende schists that mantle a core of diatexitic migmatites, defining a migmatitic dome structure around the Siapana pluton (Radelli, 1962b; MacDonald, 1964). These folded migmatites differ from the typically stromatic metatexites that characterize the Jaturuhu gneiss (Fig. 4A & D).

Folded-structured metatexites typically display granitic leucosomes of quartz-feldspathic compositions (sample GC-061; Fig. 4D), whereas hornblende composes of the melanosome. Banding ranges from cm-scale to several meters in thickness. The unit reached the upper-amphibolite facies, as determined by hornblende-almandine paragenesis (MacDonald, 1964). Towards the Macuira Range northwest, the Macuira Schists are overlain by the Jarara Formation (Figs. 2 & 3).

Permian-Triassic high-to medium grade basement (Uray gneiss)

In the southern Jarara Range, the Uray Gneiss can be differentiated into three main lithotypes i.e., Ug1, Ug2, Ug3 (Fig. 4E-G). The metamorphic units of this complex were lately intruded by muscovite-rich leucocratic dikes (Fig. 4H). Detailed structural mapping (Fig. 5) reveals a high contrast between the Uray Gneiss high-amphibolite facies rocks and the greenschist-facies overlying Jarara Formation, that at its base can be differentiated between two sub-units (Jf1 and Jf2; Fig. 5), with a decreasing metamorphic grade from high-amphibolite-facies (Ug1) to greenschist facies (Jf2) towards the NW (Fig. 5).

Uray gneiss

In the Jarara Range, the Uray Gneiss is unconformably overlain by the Oligocene deposits of the Siamana Formation (Fig. 5A). Internally, the Uray Gneiss units are arranged in a high-grade core mantled by medium-to low-grade meta-pelites with a regional NW foliation dip direction (Fig. 5). Three lithotypes are differentiated within the Uray Gneiss: amphibole mylonitic schist (Ug1, sample GC-021; Figs. 4E-5) composed by hornblende+biotite+epidote+plagioclase+quartz (Fig. 6A). High-amphibolite facies anatectic gneiss displays mostly granoblastic textures, locally foliated with leucosomatic segregations (Ug2; sample G-52d; Fig. 4F-5B) bearing pyroxene+garnet+hornblende+plagioclase (Fig. 6B-C), in which garnet crystals at the cm-scale are embedded in a pyroxene+hornblende matrix (Fig. 6C), alternated with plagioclase bands. A detachment fault separates the gneissic core (Ug2) from a unit composed of strongly foliated mylonitic schists (Ug3, Fig. 4G-5C) bearing staurolite+biotite+garnet (sample G-54; Fig. 6D). The Uray gneissic core is intruded by leucocratic dikes (sample G-52A; Fig. 4H) composed of quartz, K-feldspar, and muscovite (Fig. 6E). Sigma porphyroclasts and s-c shear bands from the Uray mylonites indicate sinistral top to NW shear sense (Fig. 6).

Figure 5 Composite topographic relief and geology of the south western Jarara range. Top: panoramic view of the Jarara range taken from point C. Center: relief map of the Jarara range showing main structures and sites A-F. Bottom: detailed geological map of the Jarara range dip data compiled from (Lockwood, 1965). Left Panel A) Angular unconformity of the Oligocene sediments of the Siamana Formation over the Uray gneiss anatectic core B) Uray gneiss with foliation parallel leucosome segregations in a Px+Grt+Hbl groundmass (Ug2), dashed lines indicate foliation C) Uray gneiss alternate of St+Grt+Bt mylonitic schists (Ug3) D) Jarara Formation fine banded quartz-muscovite protomylonites with recumbent cascading or spruce-tree folds (Jf1) E) Jarara Formation phyllites and meta-marls with steeply plunging cascading or spruce-tree folds (Jf2) F) Jarara Formation slates gently dipping towards the NW. Dashed lines indicate unconformity in A, and foliation B-F, photo insets are oriented as indicated.

Figure 6 Optical images of low- to high-grade metamorphic rocks from the Jarara range. A) Subhedral hornblende δ porphyroblast and plagioclase porphyroblasts surrounded by biotite and quartz aggregates, biotite strain shadows indicate top to NW sinistral shear sense. Sample GC-021 (Ug1), cross-polarized light. B) Poikilitic hornblende and plagioclase crystals, showing a granoblastic texture. Sample GC-52D (Ug2), cross-polarized light. C) Anhedral clinopyroxene (augite) surrounding subhedral garnet (pyrope) crystals. Sample G-52D (Ug2), transmitted light. D) Subhedral staurolite σ -porphyroblast surrounded by alternating quartz-plagioclase and biotite-muscovite strain shadows indicate top to NW sinistral shear sense. Sample G-54 (Ug3), cross-polarized light. E) Large muscovite crystals showing kink bands. Sample G-52A, cross-polarized light. F) Sericitized plagioclase σ -porphyroblast mantled by muscovite strain shadows indicate top to NW sinistral shear sense and quartz-orthoclase crystals with polygonal texture. Sample G-55B (Jf1), cross-polarized light. Abbreviations: Bt, biotite; Cal, calcite; Cpx, Clinopyroxene; Grt, garnet; Hbl, hornblende; Ms, muscovite; Pl, plagioclase; Qz, quartz; St, staurolite.

Mesozoic metasedimentary cover

Over the high-amphibolite facies Uray Gneiss, the Jarara Formation greenschist facies meta-sedimentary rocks rest unconformably. This sedimentary cover gradually decreases in metamorphic grade towards the NW. This section describes the basal part of the Jarara Formation a basal meta-conglomerate level (Jf1), which marks the contact between the two units.

Jarara Formation

The greenschist facies meta-conglomerate (Jf1; Fig. 4H; Fig. 5) is followed by alternating meta-pelites, meta-marls, and marble (Jf2). The latter frequently shows cascading folds with foliation strike parallel axes (Fig. 5 insets D, E, F).

The muscovite-rich meta-conglomerate (Jf1) displays a protomylonitic fabric (G-55b; Fig. 4I). Muscovite is the dominant index mineral that mantles feldspar, orthoclase, and quartz porphyroclasts (Fig. 6F). Along with zircon, apatite is present as an accessory, and also sporadic calcite veins cut through the foliation. The protomylonitic fabric is also defined by sinistral s-c structures (Fig. 6F) that commonly display sigmoidal plagioclase porphyroclasts with muscovite pressure shadows (Fig. 6F), indicating a top to NW sinistral displacement. The basal meta-conglomerate varies into muscovite-rich quartzites, muscovite schists, phyllites, slates, and a marble level. These are overlain by a second meta-conglomerate level in which muscovite is absent, superseded by black phyllites and slates interbedded with marbles and siliciclastic beds that are internally graded and show sporadic carbonate olistostromes. The sequence is superseded by greenschist facies mafic meta-volcanic flows and meta-tuffs, characterized by actinolite-chlorite phyllites (Fig. 7).

Figure 7. Semi-detailed Stratigraphic column of the Jarara Formation at the Jarara Range, Samples analyzed in this study are indicated within the Uray Gneiss and at the basal metaconglomerate (Jf1) of the Jarara Formation. The section is located in Figs. 2-3.

TABLE 1. LOCATION, DESCRIPTION, OF SAMPLES ANALYSED BY U-Pb and Lu-Hf LA-ICP-MS

Sample Code	Coordinates		Lithology	Stratigraphic division	Unit	Intrepreted protolith	U-Pb Age	2s	MSWD	$^{176}\text{Hf}/^{177}\text{Hf}$	ϵHf_t^e	$T_{dm}(\text{Ga})$	Type
	Lat (°N)	Long (°W)											
B-245	11.993	-71.774	Pl+Hbl+Grt+Qtz gneiss	Proterozoic	Jaturuhu Gneiss	volcanoclastic	967	4.2	0.2	-	-	-	Metamorphic rims
C-172	11.932	-71.766	Hbl lense	Proterozoic	Jaturuhu Gneiss	mafic rock	1026	5.4	1.3	-	-	-	Metamorphic Concordia Age
B-235	11.889	-71.902	Pl+Kfs+Qtz Gneiss	Proterozoic	Jojoncito Gneiss	pelite	1009	3.8	0.8	-	-	-	Metamorphic Weighted Average Age
G-95	11.876	-71.923	Kfs+Pl+Qtz	Proterozoic	Jojoncito Gneiss	granitoid	1039	14.5	1.8	-	-	-	Metamorphic Weighted Average Age
							238	30	2.7	-	-	-	Lower intercept
GC-061	12.194	-71.351	Pl+Hbl+Bt+Qtz	Proterozoic	Macuira Schists	mica schist	880	4.2	0.8	-	-	-	Metamorphic rims
GC-021	12.136	-71.513	Hbl+Ep+Pl+Qtz	Permian	Uray Gneiss	mafic rock	272	1.1	0.6	-	-	-	Core ages
				Jurassic			198	4	0.1	-	-	-	Metamorphic rims
G-52D	12.047	-71.547	Px+Grt+Hbl+Pl gneiss	Triassic	Uray Gneiss	mafic rock	230	0.5	0.9	0.282165-0.282886	(-2.4-8.7)	0.7-1.3	Metamorphic Concordia Age
G-54	12.065	-71.577	St+++Bt+Grt+Pl+Qtz mylonite	Triassic	Uray Gneiss	pelite	223	0.6	1.3	0.281706-0.282778	(-32-10)	1.2-3.5	Metamorphic Concordia Age
G-52A	12.047	-71.547	Pl+Ms+Qtz leucocratic dike	Jurassic	Jurassic Intrusive suite	granitoid	170	2.2	0.1	0.282638-0.282883	(-1.5-6.9)	0.9-1.2	Magmatic Concordia age
G-55B	12.072	-71.584	Qtz+Pl+Ms meta-conglomerate	Jurassic	Jarara Formation	pelite	157	3.4	1.5	0.280791-0.282903	(-27.8-7.8)	0.9-3.1	Maximum depositional Age
JOJON-1	11.871	-72.024	Granitic Gneiss	Proterozoic	Jojoncito Gneiss	granitoid	916	19	0.5	-	-	-	Metamorphic rims
AVO-3	12.122	-71.438	Ms+Bt+Qtz+Pl schist	Triassic	Uray Gneiss	pelite	248	4.1	0.4	-	-	-	Metamorphic weighted average age
AVO-6	12.127	-71.438	Ms+Bt+Qtz+Pl schist	Triassic	Uray Gneiss	pelite	246	3.9	0.5	-	-	-	Metamorphic weighted average age

Mineral abbreviations used in the text, figures, and tables: **Bt**: Biotite, **Ep**: Epidote, **Grt**: Garnet, **Hbl**: Hornblende, **Ksp**: Potassium feldspar, **Ms**: Muscovite, **Pl**: Plagioclase, **Px**: Pyroxene **Qtz**: Quartz, **St**: Staurolite

Samples in italic belong to previous works (Weber et al., 2009, Cardona et al., 2006)

MSWD of equivalence, uncertainties are propagated at 2s level

4.2 Zircon U-Pb geochronology and trace element geochemistry

Proterozoic high-grade metamorphic basement

Geochronological results reveal that the Proterozoic units of the Guajira Arch outcrop in the Simarua and Macuira ranges. The units described in this section yield distinctive zircon age spectra and morphological traits presented in the following paragraphs and summarized in Tables 1 and 2 and Figures 8-10A.

Jaturuhu Gneiss

The Jaturuhu Gneiss zircon spectra (sample B-245) comprises Paleoproterozoic inherited cores in some cases with twinned grains mantled by bright rims (Fig. 8A), in arrays of complex zoning patterns, showing intragrain crystallographic misorientation, and truncating geometries (Table 2), with ages spanning between 2005-1630 Ma, mantled by Meso-Neoproterozoic rims with ages spanning 1400-950 Ma. Discordant ages yield an upper intercept ca. 1837 ± 89 Ma and a Neoproterozoic lower intercept ca. 1041 ± 40 Ma (Table. 1), pointing to metamorphic recrystallization (Fig. 8A). The youngest four rims cluster around a Concordia age of 967 ± 26 Ma (MSWD= 2.6; Fig. 9A). The Paleo-Neoproterozoic growth zones can be observed in several crystals (Fig. 8A). Five crystals were recovered from an amphibolite melanosome within the Jaturuhu Gneiss (sample C-172; Fig. 8B), out of which four yield a Concordia age of 1026 ± 31 Ma (MSWD = 2.4; Fig. 9B). One of the crystals exhibits an inherited core of 1151 Ma, mantled by thick bright rims (Fig. 8B).

Jojoncito gneiss

The Jojoncito Gneiss samples (B-235, G-95) yield ages between 1300-1000 Ma. Both analyzed samples lack Paleoproterozoic inherited cores (Fig. 8C-D). Quartz-feldspathic gneiss (sample B-235) attests for partial recrystallization at 1008 ± 7.2 Ma (MSWD=0.85; Fig. 9C), with cores mantled by brighter rims that display slightly misoriented cores.

Figure 8. Panchromatic cathodoluminescence imagery of zircons from the Proterozoic units of the Guajira Arch analyzed in this study: A) Quartz-feldspathic gneiss with augen texture (B-245, Jaturuhu Gneiss); B) Amphibolite melanosome (C-172, Jaturuhu Gneiss); C) Quartz-feldspathic gneiss with granoblastic texture (B-235, Jojoncito Gneiss); D) Felsic granulite (G-95, Jojoncito Gneiss); E) Folded structured metatexite (GC-061, Macuira Schists). U-Pb ages are indicated in cores and rims, values in italics correspond to discordant data. Dashed circles ablation size diameter 25 μm except for sample G-95 that was analyzed with a spot of 30 μm .

Zircons retrieved from a granoblastic felsic gneiss (sample G-95) show a low CL response with homogenized crystals and a weighted average age of 1039 ± 28 Ma (MSWD= 1.77; Figs. 8D & 9D). The whole dataset, including discordant ages, describes a Triassic lower intercept at ca. 238 ± 61 Ma (MSWD= 2.7; Fig. 9D).

Figure 9. Composite plot of zircon U-Pb LA-ICP-MS geochronological data from the Jaturuhu (A-B) and Jojoncito gneisses (C-D) at the Simarua range. Metamorphic ages are calculated from rim recrystallization, lower intercepts, and weighted average values. Green ellipses represent cores, and red ellipses represent rims.

Macuira schists

Zircons from a folded metatexite of the Macuira Schists (sample GC-61) are subhedral and display intensely resorbed rims, with inherited cores with internal crystallographic misorientation (Fig.8E). Analyzed crystals resulted in 75 % of discordant ages that rendered meaningless lower and upper intercepts (Fig. 11A). The remaining concordant data includes

Mesoproterozoic grains of 1400-1000 Ma from inherited cores. A younger age cluster of 6 Neoproterozoic crystals yields a concordant age of 880 ± 16 Ma (MSWD= 1.7; Fig. 10A).

Figure 10. Composite plot of zircon U-Pb LA-ICP-MS geochronological data from the A) Folded structured metatexite from Macuira Schists (sample GC-061) and B) amphibole-epidote mylonitic schist (Ug1, sample GC-021). Intercept ages were calculated without filtering 10% of discordance. Metamorphic ages are calculated from Concordia age of youngest age peak. Green ellipses represent cores, and red-blue ellipses represent rims.

Permian-Triassic high-to medium-grade basement (Uray gneiss)

Amphibole+epidote mylonitic schists (Ug1)

Thirteen zircon crystals were recovered from a hornblende+epidote+plagioclase+quartz mylonitic schist (sample GC-21). Age data indicate a Permian Concordia age at ca. 272 ± 1.9 Ma (MSWD=0.64) with three Jurassic growth sectors of ca. 198 ± 5.5 Ma (MSWD=0.10; Fig. 10B) in rims. Zircons display complex growth zoning, local intermediate resorption, sector to patchy zoning, and subhedral shapes (Fig. 11A; Table 2).

Figure 11. Panchromatic cathodoluminescence imagery of zircons from the Permian-Jurassic units of the Guajira Arch analyzed in this study, with U-Pb age and ϵHf_i : A) Amphibole+epidote mylonitic schist (GC-021, Ug1; Uray Gneiss); B) Pyroxene+garnet+hornblende gneiss, (G-52D, Ug2; Uray Gneiss); C) Staurolite+biotite+garnet mylonite (G-54, Ug3; Uray Gneiss); D) Leucocratic dike muscovite+plagioclase (G-52A, Siapana Granodiorite suite); E) Quartz-muscovite protomylonitic meta-conglomerate (G-55B, Jf1; Jarara Formation). Dashed circles ablation size diameter for U-Pb analyses 30 μm and 50 μm for Lu-Hf analyses.

Pyroxene+ Garnet+Hornblende gneiss (Ug2)

The obtained crystals from this garnet-rich anatectic gneiss (sample G-52D) show regular polygonal, oscillatory, or sector, generally weak zoning (Fig. 11B), and define a Carnian Concordia age of 230 ± 1.2 Ma (MSWD=1.2; Fig. 12A). All analyzed spots either in cores or rims are within this age range, and there are no inherited cores preserved (Fig. 11B). All crystals are strongly depleted in HREE, with average values below 900 ppm and a high U/Yb ratio (Figs. 12A and 13).

Figure 12. Composite plot of zircon U-Pb LA-ICP-MS geochronological data from the A) Uray gneiss Px+Grt+Hbl gneiss (Ug2, sample G-52D) and B) Uray gneiss St+Bt+Grt mylonite (Ug3, sample G-54). Below, Primitive chondrite-normalized REE patterns (McDonough and Sun, 1995). Green ellipses represent cores, and red ellipses represent rims.

Staurolite+ Biotite+Garnet mylonitic schists (Ug3)

Zircons recovered from these mylonites (G-54) yield inherited cores differentiated from highly resorbed rims by truncating geometries (Fig. 11C; Table 2). Age spectra are defined by inherited cores that range between 1500-500 Ma (Fig. 12B). Rims, in contrast, are restricted to the Norian, with a Concordia metamorphic age of 223 ± 4.7 Ma (MSWD= 3.7; Fig. 12B). Cores are enriched in HREE in comparison with rims, and concentrations are below 1000 ppm. Triassic rims are constantly below 500 ppm. Accordingly, Triassic crystals display low Yb and Y contents and high U/Yb ratios (Fig. 12B and 13).

Figure 13. Uray Gneiss, Jarara meta-conglomerate and leucocratic dike zircon trace element geochemistry (including Phanerozoic inherited cores) bivariate plot. A) Th vs. U plot and B) U-Nb-Yb-based zircon discrimination plot and density distribution based on geochemical proxies or tectono-magmatic setting, after Grimes et al., (2015). The shaded fields are overlapping two-dimensional kernel density distributions for compiled datasets of the mid-ocean ridge (MOR-type), plume-influenced settings of Iceland & Hawaii (ocean-island (OI)-type), and continental arc (Cont. arc-type) zircon.

Leucocratic Dike

A plagioclase+muscovite+quartz pegmatitic dike (sample G-52A) intruding the pyroxene+garnet++hornblende Uray Gneiss (Ug1) yields zircons with a low CL response,

internal morphology is barely discernible with weak oscillatory zoning (Fig. 11D). Ages are mainly discordant, evidencing extensive common Pb incorporation. Data obtained from cores are highly discordant, and only 11 concordant ages in rims indicate a Middle Jurassic (Bajocian) age of crystallization at ca. 170 ± 2.7 Ma (MSWD=1.2; Fig. 14A). The HREE concentrations are extremely high, up to 10000 ppm with high U/Yb ratios (Fig. 13).

Figure 14. Composite plot of zircon U-Pb LA-ICP-MS geochronological data from the A) leucocratic dike intruding Ug2 (sample G-52A) and B) Jarara Formation basal meta-conglomerate Ms+Pl+Qtz (sample G-55B). Below, Primitive chondrite normalized REE patterns (McDonough and Sun, 1995). Green ellipses represent cores, and red ellipses represent rims.

Mesozoic metasedimentary cover

Jarara Formation Protomylonitic meta-conglomerate (Jf1)

Zircons retrieved from the basal meta-conglomerate of the Jarara Formation (sample G-55b) display a wide morphological and age range, commonly with inherited cores, differentiated from highly resorbed rims by truncating geometries or separated subrounded and unzoned cores. Several crystals show regular polygonal, oscillatory, or sector zoning and are mainly concordant (Fig. 11E).

This sample zircon age range includes two Paleoproterozoic crystals and a single Paleoproterozoic concordant crystal at 3432 ± 22 Ma. The remaining analyzed crystals from this sample comprises four coherent populations, as follows: (i) The 1200-1000 Ma inherited cores may or not be mantled by recrystallized rims; (ii) Ediacaran - Devonian (770-400 Ma); (iii) a Permian-Triassic population between 280 and 218 Ma (Fig. 14B); and (iv) the youngest population composed of four Jurassic ages corresponding to two grains containing two consistent analyses each, which constrain a maximum depositional age for the meta-conglomerate at ca. 157 ± 17.8 Ma (MSWD=1.5; Fig. 14B). Distinctively, most Triassic ages are found as rims that mantle Paleozoic or older cores (Fig. 11E). Most cores and rims are enriched in HREE with values between 900 and 7000 ppm, and variable Yb contents oscillating between 30-7000 ppm (Figs. 13-14B).

4.3 Zircon Hf isotope geochemistry

We conducted Lu-Hf isotopic analyses on three samples from the Uray Gneiss suite and one sample from the Jarara Formation (G-52D, G-54, G-55B, G-52A). These were previously analyzed by U-Pb dating with spots of different sizes but in the same growth zones (Fig. 11).

The results are summarized in Table 1. In Figure 15, the initial $^{176}\text{Hf}/^{177}\text{Hf}$ is calculated using individual apparent $^{206}\text{Pb}/^{238}\text{U}$ ages of laser spots measured on the same zircon growth zones.

Samples yield a broad range of ϵHf_i values of +10 to -30 (Fig. 15; Table 1), evidencing both crustal recycling and the addition of new crust (e.g., Collins et al., 2011). Inherited zircon cores (~275 Ma to ~1.2 Ga) within the sampled meta-sediments plot on the CHUR array (Fig. 15) and represent the range of meta-sedimentary protoliths that underwent crustal anatexis.

Uray gneiss

Pyroxene+Garnet+Hornblende gneiss (Ug2)

Triassic crystals of sample G-52D yield $^{176}\text{Hf}/^{177}\text{Hf}$ values ranging from 0.282165 to 0.282886 (ϵHf_i from -2.4 to +8.7; Figs 11B & 15), making this sample the most juvenile in composition. A single Devonian core yields ϵHf_i -13.7. Thus, the ϵHf spectrum is dominated by juvenile compositions with the mixing of older crustal unradiogenic sources. The crustal $T_{\text{DM(Hf)}}$ model ages range from ~0.7 to ~1.3 Ga for all Triassic crystals (~230 Ma; Fig. 15) and ca. 2.17 Ga for the Devonian core.

Staurolite+Biotite+Garnet mylonitic schists (Ug3)

Triassic rims from sample G-54 yield $^{176}\text{Hf}/^{177}\text{Hf}$ ranging from 0.281706 to 0.282778 (ϵHf_i -32 to +0.86). Ordovician to Permian inherited cores yield $^{176}\text{Hf}/^{177}\text{Hf}$ of 0.281960 to 0.282911 and displayed dominantly negative values (ϵHf_i from -23.3 to +0.7; Figs. 11C and 14) that hint at the reworking of older crustal unradiogenic sources.

$^{176}\text{Hf}/^{177}\text{Hf}$ values from Proterozoic cores fluctuate between 0.280864 to 0.282353 (ϵHf_i from -7.5 to +7.4; Figs. 11C & 15). The crustal $T_{\text{DM(Hf)}}$ model ages for all Triassic rims ranges from ~1.2 to ~3.2 Ga (Fig. 15, Table A3), with dominant Paleo-Mesoproterozoic ages,

TABLE 2. MORPHOLOGICAL TRAITS AND TRACE ELEMENT GEOCHEMISTRY OF ZIRCONS ANALYSED BY U-Pb LA-ICP-MS

Sample Code	Lithology	Unit	Zircon Morphology	CL Zoning	Process	Th/U	Y
B-245	Qtz+Kfs+Pl and Cpx+Hbl+Bt+Grt gneiss	Jaturuhu Gneiss	Subrounded subhedral translucent	Complex zoning as intragrain crystallographic misorientation, the formation of twinned grains and subgrains. Inherited cores mantled by rims with truncating geometries separated subrounded, oscillatory zoned, chaotically zoned cores	Crystallization from a melt or precipitation from a fluid evidencing several stages of deep resorption	0.04- 1.0 cores 0.03-0.4 rims	-
C-172	Amphibolite lens	Jaturuhu Gneiss	Subrounded subhedral translucent	High CL response crystals display weak oscillatory zoning tending to homogeneous, subrounded shapes and homogeneous texture indicates high resorption	Crystallization from a melt or precipitation from a fluid evidencing several stages of deep resorption	0.05-0.3	-
B-235	Quartzfeldspathic Gneiss	Jojoncito Gneiss	Subrounded subhedral translucent	Dark inherited cores mantled by brighter rims, complex zoning patterns intragrain crystallographic misorientation, the formation of subgrains, truncating geometries, or separated subrounded, homogeneous, or chaotically zoned cores with rutile inclusions.	Crystallization from a melt or precipitation from a fluid evidencing several stages of deep resorption	0.1-0.6 cores, 0.06-0.3 rims	-
G-95	Kfs+Pl+Qtz	Jojoncito Gneiss	Subrounded, subhedral, Translucent, fractured	Crystals appear completely dark and homogeneous, with a rugged surface of porosity and inclusions	Homogenization process, hydrothermal alteration reprecipitation	0.05-0.4	1000-5300
GC-061	Pl+Hbl+Qtz folded structured metatextite	Macuira Schists	Translucent to slightly yellowish color, and are characterized by sub-rounded sub-anhedral shapes	Highly resorbed rims subhedral and xenocrystic cores with the sub-grain formation and internal crystallographic misorientation, sometimes show patchy zoning and homogenization	Crystallization from a melt or precipitation from a fluid, migmatization, in -situ anatectic recrystallization	0.4-1.3	-
GC-021	Amphibolite	Uray Gneiss (Ug1)	Subhedral dipyrmidal translucent	Complex growth zoning, local intermediate resorption, sector to patchy zoning, and subhedral shapes, rims display patchy and convoluted zoning	Metamictization, fluid alteration, initial stages of replacement	0.8-1.65	-
G-52D	Px+Grt+Hbl+Pl gneiss	Uray Gneiss /(Ug2)	Translucent, subangular, euhedral, dipyrmidal prismatic	Regular polygonal, oscillatory, or sector, generally weak zoning	Anatexis	0.05	20-250
G-54	St+Bt+Grt+Pl mylonite	Uray Gneiss (Ug3)	Translucent and subangular dipyrmidal prismatic.	Inherited cores, differentiated from highly resorbed rims by truncating geometries,	High strain rates and mylonitization	0.3 rims, 1.1 cores	150-2400
G-52A	Pl+Ms+Qtz leucocratic dike	Jurassic Intrusive suite	Euhedral dipyrmidal prismatic with a prism-pyramid ratio of 2:1	Low CL response and crystals appear dark, internal morphology is barely discernible. Weak Oscillatory zoning. Cores appear with patchy and mosaic zoning, some inclusions	Metamictization, fluid alteration, or hydrothermal conditions	0.2-0.01	1000-15000
G-55B	Qtz+Pl+Ms meta-conglomerate	Jarara Fm. (Jf1)	Translucent and subangular euhedral, dipyrmidal and elongated prismatic.	Inherited cores, differentiated from highly resorbed rims by truncating geometries or separated subrounded, and unzoned cores. Crystals show regular polygonal, oscillatory, or sector zoning	Detrital zircon derived from igneous/metamorphic sources	1.5-0.02 cores, 0.6-0.02 rims	90-3000

Th-U ratios are reported as an average of cores and rims or a single value if constant, Y content is reported in ppm, morphology described according to Murali et al., 1983; Vavra et al., 1999; Rubatto, 2017, Harley et al., 2007, Schaltegger et al., 1999

and a single Neoproterozoic $T_{DM(Hf)}$ age ~ 0.9 Ga. Similar tendencies are disclosed for Permian to Ordovician inherited cores with $T_{DM(Hf)}$ age values between ~ 1.2 to ~ 3.0 Ga. Proterozoic cores disclose exclusively Paleoproterozoic and older $T_{DM(Hf)}$ age values ~ 1.5 to ~ 3.5 Ga. Overall dominant-negative ϵHf values hint at the reworking of older crustal unradiogenic sources (Fig. 15).

Leucocratic Dike

Jurassic crystals of sample G-52d yield $^{176}Hf/^{177}Hf$ ranging from 0.282638 to 0.282883 (ϵHf_i from -1.5 to +6.9; Figs. 11D & 15), with a narrow compositional spectrum that clusters toward the CHUR array. It indicates the input of primitive sources and slightly depleted juvenile compositions. The crustal $T_{DM(Hf)}$ model ages range from ~ 0.9 to ~ 1.2 Ga for all Jurassic crystals (~ 170 Ma; Fig. 15).

Jarara Formation Protomylonitic meta-conglomerate (Jf1)

Jurassic crystals from sample G-55b yield $^{176}Hf/^{177}Hf$ ranging from 0.282583 to 0.282903 (ϵHf_i from -2.8 to +0.31; Figs. 11E & 15). Triassic crystals yield $^{176}Hf/^{177}Hf$ ranging from 0.282481 to 0.282740 (ϵHf_i from -5.1 to +3.6), whereas Permian to Ordovician crystals yields $^{176}Hf/^{177}Hf$ ranging from 0.281688 to 0.282773 (ϵHf -27.8 – +7.8). The latter compares to Proterozoic inherited cores that yield $^{176}Hf/^{177}Hf$ ranging from 0.280791 to 0.282489 (ϵHf_i from -24.2 to +7.3).

The crustal $T_{DM(Hf)}$ model ages vary from ~ 0.9 to ~ 1.5 Ga for all Mesozoic crystals, whereas for Paleozoic crystals $T_{DM(Hf)}$ model ages are older (~ 1.2 to ~ 3.1 Ga; Fig. 15). Younger crystals plot closer to the CHUR array and are representative of the range of meta-sedimentary protoliths that underwent crustal anatexis.

Figure 15. $^{176}\text{Hf}/^{177}\text{Hf}$ versus time diagrams for samples from the Jarara Range showing depleted mantle and chondritic uniform reservoir (CHUR) evolution trends after Bouvier et al. (2008). (A) Initial ϵ_{Hf} versus $^{206}\text{Pb}/^{238}\text{U}$ apparent ages of individual zircon grains, every single analysis represented by a point. Crustal evolution models for different $T_{DM(Hf)}$ ages for zircons assume that it crystallized from a system with a time-integrated $^{176}\text{Lu}/^{177}\text{Hf}$ ratio of 0.015 (Griffin et al., 2002). (B) Empirical cumulative distribution curves for model ages of the data from samples analyzed in this study. Compiled T_{DM} ages range between 900-1750 Ma, note meta-sediments yield older components with mostly negative ϵ_{Hf} crustal values, whereas anatectites and dikes indicate T_{DM} ages around 900-1200 Ma and juvenile positive ϵ_{Hf} values. (C) Lower vs. upper quartile Hf model age plot for the samples of Triassic metamorphic rocks of the Uray gneiss, and late leucocratic dike. Model ages have been calculated relative to a commonly accepted depleted mantle model and plotted using the detzrc CRAN package for R (Andersen et al., 2018).

5. DISCUSSION

The basement of the northern Andes has been investigated (Macdonald and Hurley, 1969; Cordani et al., 2005; Cardona et al., 2006, 2010a), revealing the presence of Proterozoic inliers that compose the northernmost portion of the Guajira peninsula denominated as the Guajira Arch.

Regarding an Early Mesozoic evolution of the Guajira Arch, there is an ongoing discussion if this basement inlier currently disconnected from the main Andean trunk system is autochthonous or para-autochthonous to north-western Gondwana (MacDonald and Opdyke, 1972; Bartok et al., 2015; Nova et al., 2019). In the following paragraphs, we will discuss the

geochronological and isotopic characteristics of the Guajira Arch Proterozoic basement and its reworking during a Triassic tectono-thermal event.

Meso-Neoproterozoic metamorphism

The Guajira Arch Proterozoic basement holds evidence of at least two metamorphic recrystallization episodes during the Late Mesoproterozoic and the Early Neoproterozoic (Lockwood, 1965). The Jaturuhu Gneiss yields distinctive 2.0 – 1.7 Ga Paleoproterozoic inherited cores, which underwent recrystallization by the end of the Mesoproterozoic at ca. 1041 ± 40 Ma, as indicated by the Discordia lower intercept (Fig. 9A). The examined amphibolite melanosome discloses similar age trends ca. 1026 ± 31 Ma (Fig. 9B), suggesting an age range (1050-1020 Ma) for the stromatic banding event (Radelli, 1962b), affecting a Paleoproterozoic basement. Paleoproterozoic U-Pb ages are comparable to the ages of migmatites and orthogneisses in Oaxaquia and the southern Chiapas Massif (Fig. 16), which underwent a granulite facies metamorphism at ca. 990 Ma (Weber and Schulze, 2014; Ortega-Gutiérrez et al., 2018; Solari et al., 2018). The latter is close to rim recrystallization ca. 967 ± 26 Ma ages of the Jaturuhu gneiss (Figs. 9A and 16).

The Jojoncito Gneiss granulite facies metamorphism led to anatexis at temperatures $> 700^{\circ}\text{C}$ (Zuluaga et al., 2009). The ages for the Jojoncito Gneiss reveal inheritance from Mesoproterozoic magmatic sources between 1.4 -1.0 Ga. The timing of this episode is constrained to 1039 ± 28 Ma, and 1009 ± 7 Ma, which broadly correlates to the migmatization age of the Jaturuhu Gneiss and closely precedes a metamorphic event at ca. 990 Ma, corresponding to the climax of the Putumayo orogeny of western Amazonia (Cordani et al., 2005; Cardona et al., 2006; Ibañez-Mejía, 2020). The Jojoncito gneiss ages are indistinguishable from the Atuschón gneiss metamorphic ages ca. 1028 ± 34 Ma, with rim ages ca. 967 ± 5.8 Ma (Baquero et al., 2015).

Figure 16. Stratigraphic summary sketch of the Guajira Arch, Sierra Nevada de Santa Marta massif, North Central Cordillera, South Central Cordillera, Ecuador (Northern Andes), Oaxaquia-Acatlán, and Maya block (Central American - Mexican) from the Mesoproterozoic to Neoproterozoic. Major tectono-metamorphic events are indicated, references are disclosed in the discussion.

Interestingly, although Jaturuhu and Jojoncito gneisses share similar metamorphic ages, our data reveal a missing Paleoproterozoic inheritance in the Jojoncito Gneiss (Fig. 9C-D), while the Jaturuhu Gneiss lacks a Mesoproterozoic inheritance between 1.25 -1.6 Ma (Fig. 9A-B). This indicates that the two gneissic complexes were derived from different protoliths. Besides, the zircon morphology in both complexes varies significantly with dark homogenized crystals from the Jojoncito gneiss contrasting with the typical metamorphic crystals with inherited cores of the Jaturuhu gneiss (Fig. 8).

Paleoproterozoic cores yield high Th/U ratios between 1.0-0.4, whereas rims with Mesoproterozoic U/Pb ages show Th/U values decreasing from 0.3 to 0.05, and younger rims with Neoproterozoic U/Pb ages have the lowest Th/U ratios between 0.2-0.06. This evidence a decrease in the Th/U ratio towards younger ages, thus stressing the importance of an Early-Neoproterozoic metamorphic event.

In synthesis, the Proterozoic basement of the Guajira Arch was affected by metamorphism during the Putumayo orogeny of western Amazonia at the final stages of Rodinia amalgamation (Ibañez-Mejia, 2020). Therefore, the Guajira Arch Proterozoic basement shares a common tectono-magmatic history with central-American Oaxaquia and Maya blocks, in agreement with other localities of the Northern Andes (Santa Marta Massif, Garzón Massif, Santander Massif, Central Cordillera, and the Falcon basin; Kroonenberg, 1982; Ruiz et al., 1999; Ordóñez, 1999; Cordani et al., 2005; Cardona et al., 2010a; Ibanez-Mejia et al., 2011; Baquero et al., 2015; Cediel et al., 2019; Fig. 16).

Furthermore, the geochronological age spectrum of the Jojoncito Gneiss is similar to ages documented at the southern Chiapas Massif, affected by an age-equivalent Meso-Neoproterozoic metamorphic event (Weber and Schulze, 2014; Weber et al., 2018; Fig. 16), comprising inherited cores of age ca. 1005 ± 7 Ma, with rim recrystallization by 950 ± 8 Ma. On the other hand, the Macuira Schists record a younger Neoproterozoic event at ca. 880 ± 16 Ma (Fig. 10A) through extensive zircon recrystallization, similar to the youngest metamorphic ages of the southern Chiapas Massif (Belisario Dominguéz and Chipilín gneisses; Weber et al., 2018; Fig. 16), which are strikingly younger than the widespread 990-960 Ma event.

Permian magmatism

Our data reveal that hornblende+epidote mylonitic schists (Ug1) from the Uray Gneiss suite yield a Permian age, with a crystallization age of ca. 272 ± 1.9 Ma and high Th/U ratios

between 0.8 and 1.67 lacking inherited cores (Fig. 11A). Elevated Th/U ratios in Permian amphibole schists from the Guajira Arch may indicate they are derived from an igneous protolith, most likely of mafic composition evidencing igneous activity by this period.

Widespread Permian continental arc-magmatism, bracketed between 288 and 255 Ma is documented in Northern Mexico (Arvizu et al., 2009), the southern Chiapas massif and Acatlán complex (Weber et al., 2007; Ortega-Obregón et al., 2014), the Maya block (Ratschbacher et al., 2009), the Paraguana Peninsula (van der Lelij et al., 2016b) the Santa Marta Massif (Cardona et al., 2010b; Piraquive, 2017), the Central Cordillera (Vinasco et al., 2006b; Cochrane et al., 2014a; Bustamante et al., 2017; Shaw et al., 2019), and the Ecuadorian Andes (Paul et al., 2018), evidencing subduction-related diachronic magmatism along with western Gondwana (Riel et al., 2018; Spikings and Paul, 2019; Figs. 17-18B)

Triassic metamorphism

In the Guajira Arch, previous works documented Early Triassic mylonites at the Uray Gneiss, with an age ca. 246 ± 3.9 Ma (Weber et al., 2010; Fig. 2). New data at the Jarara Range evidence Triassic metamorphism spanning ca. 230-223 Ma (Fig. 12), with ϵ_{Hf_i} (from -2.4 to 8.7) that hints at the incorporation of juvenile material (Fig. 15) with Model T_{DM} ages of ~0.8 to ~1.3 Ga (Fig. 15) may indicate *in-situ* anatexis of the Macuira Schists by incorporation of juvenile material.

Middle-Late Triassic ages of 245-223 Ma for the anatectic core emplacement and mylonitization, were rapidly followed by cooling as evidenced by $^{40}\text{Ar}/^{39}\text{Ar}$ and K-Ar ages from the Macuira Schists spanning 220-160 Ma (MacDonald, 1964; Cardona et al., 2006). Triassic metamorphism is widely recognized along the Andes and is characterized by crustal attenuation and anatexis. It has been described in La Secreta mylonites at the Santa Marta Massif (Piraquive,

2017), the Central Cordillera (Vinasco et al., 2006a; Cochrane et al., 2014a), and in El Oro Complex at the Ecuadorian Andes (Riel et al., 2013), sharing a similar age span, lithological varieties, and Hf isotopic signature (Fig. 17).

Figure 17. Stratigraphic summary sketch of the Guajira Arch, Sierra Nevada de Santa Marta massif, North Central Cordillera, South Central Cordillera, Ecuador (Northern Andes), Oaxaquia-Acatlán, and Maya block (Central American-Mexican) from the Permian to Jurassic. Major tectono-metamorphic events are indicated, references are disclosed in the discussion.

Late Permian magmatism and Early Triassic anatexis are documented at ca. 263–243 Ma in the Marathon-Sonora section of the Pangaea collision zone in the western Gulf of Mexico (Coombs et al., 2020), whereas localized exposures of igneous rocks in the Maya Block range between 249–226 Ma (Spikings and Paul, 2019, and references therein; Fig. 17) Triassic

anatectites are also documented at Oaxaquia, southern Chiapas Massif, Acatlán and Xolapa complexes (Fig. 17; Helbig et al., 2012).

The Triassic metamorphic record in the Central American-Mexican terranes and North America indicates that orogenic metamorphism was terminated by extension and followed by rifting during Pangaea break-up (Estrada-Carmona et al., 2009). The overlap between Central American- Mexican terranes and South America would correspond to the Acatlán, Xolapa complexes, and southern Chiapas Massif, juxtaposed against the Central Cordillera, Santa Marta Massif, and Guajira Arch, in which Oaxaquia may constitute the oldest crust of the conjugate margin.

Late Triassic metamorphism during extension is recorded at the Maya block and Chuacús complex as rim recrystallization ages in detrital rocks (Spikings and Paul, 2019, and references therein). At the Guajira Arch, anatexis at ca. 230 Ma was in part a delayed thermal response from a back-arc extension, causing U-Pb resetting of Proterozoic zircons. In this scenario, back-arc extension and increased geothermal gradients due to ascending sub-lithospheric continental mantle may have given rise to a gneissic dome formation *sensu* Whitney et al. (2004; Fig. 18A).

The processes involved in the formation of the Guajira Arch Triassic core complex (Fig. 18C) can be thus related to roll-back extension and rifting at the initial stages of western Pangaea break-up between 235 and 216 Ma (Cochrane et al., 2014a; Spikings and Paul, 2019), which is also documented at the Santa Marta Massif, where rift sequences of Carnian age attest for extension during this epoch (Gómez et al., 2021). Furthermore, extensional mechanisms driving anatexis by crustal extension at the Guajira Arch are evidenced by a top-to NW sinistral shear sense observed in the mylonitic units of the Uray Gneiss (Ug1, Ug3; Fig. 6), that also decrease in metamorphic grade towards the NW, in contrast to an anatectic core mostly granoblastic (Ug2, Fig. 6), indicating a ductile to brittle-ductile shear zone.

In synthesis, for the interval 245-220 Ma, the formation of a mylonitic lower grade detachment (Ug3) assisted the emplacement of the anatectic core (Ug2) at upper crustal levels.

Although the schematic representation of a gneissic dome (Fig. 18A) provides insight into the relationships between the metamorphic complexes described for the Guajira Arch, further detail to establish a more precise structural context is still pending task. However, so far the combined field, petrographic, structural observations, and the new geochronological and isotopic datasets presented in this work may be conceptualized as the architectural elements of a cordilleran metamorphic core complex (Fig. 18A; Whitney et al., 2004, 2013). In this scenario, upper plate extension may have been caused by decreasing convergence and slab steepening during the Late Triassic, in which rejuvenation of the lower crust in a back-arc setting was prompted by the incorporation of juvenile material from the asthenosphere (Costa and Rey, 1995; Chapman et al., 2017).

Analogous structural configurations involving anatexis, mafic underplating, and isothermal decompression are bracketed within the same timespan 230-220 Ma at the Ecuadorian Andes in El Oro Metamorphic Complex (Riel et al., 2013). Thus, it implies a large-scale thermal anomaly occurring at the western Gondwana margin during the Late Triassic.

Jurassic arc build-up

Jurassic magmatism is well documented at the northern Andes and Central-American and Mexican terranes (McHone, 2000; Pérez-Gutiérrez et al., 2009; Stanek et al., 2009; Villagómez and Spikings, 2013; Spikings et al., 2015; Bustamante et al., 2016; Centeno-García, 2017; Rodríguez et al., 2018; Shaw et al., 2019). At the Guajira Arch, Jurassic magmatism is evidenced by the two-stage evolution of a magmatic arc, comprising the Siapana Granodiorite and associated granitoids, and the syn-tectonic volcanoclastic deposits of the Cosinas through, south

of the Cuisa fault (Rollins, 1965; Zuluaga et al., 2015). Protracted emplacement of the Siapana granodiorite at the upper plate at ca. 195 ± 8 Ma, 167 ± 9.4 Ma and 158 ± 0.6 Ma (Cardona et al., 2006; Rodríguez–García et al., 2020) is evidenced by zircon inheritance, negative ϵNd_i -5.90, and a model T_{DM} age of = 1.45 Ma, highly similar to the hosting Macuira schists T_{DM} Sm-Nd model age of 1.47 Ga (Cardona et al., 2006).

The emplacement of magmas derived from crustal sources was coeval to volcanic activity. Besides, calc-alkaline signature, light rare earth element enrichment, Nb-Ta depletion, and Eu negative anomaly attests for a subduction-related affinity in a converging tectonic-setting (Zuluaga et al., 2015). Magmatic arc build-up was coeval to the development of a continental back-arc basin built in a low-lying magmatic arc (Fig. 18D), as evidenced by the silicic volcanism of the Ipapure rhyodacite by 184 ± 0.7 Ma (Zuluaga et al., 2015). In this scenario, a newly formed basin at the Cosinas trough was filled by sediments mixed from volcanic sources and the Guajira Arch exposed basement (Nova et al., 2019).

Recrystallized sectors of Jurassic age in Permian amphibole mylonitic schists evidence the thermal overprint of magmatism at ca. 180 Ma. At the Jarara range, Jurassic dikes related to the Siapana Granodiorite suite intruded the Uray gneiss anatectic core (Ug2) at ca. 170 ± 2.7 Ma. Trends of near CHUR to positive ϵHf_i values of these dikes (Figs. 15 & 18) indicate mixing of primitive sources and slightly depleted compositions. In the setting of a low-lying magmatic arc (Zuluaga et al., 2015), crustal attenuation would lead to melts originating in the upper mantle and closest to the trench, resulting in an isotopically juvenile material with asthenospheric contributions (Chapman et al., 2017).

This may indicate that Triassic crustal attenuation, anatexis, and possibly doming, was followed by slab advance during Early-Middle Jurassic (Fig. 18C-D). Jurassic magmatic activity preceded the expansion of local depocenters, in which the cessation of volcanism is defined by

the development of a mixed siliciclastic-carbonate marine platform since the Callovian ca. 166 Ma (Renz, 1960; Rollins, 1965; Quintero, 2017; Nova et al., 2019).

Figure 18. A) Schematic view of a gneissic dome adapted from Whitney et al. (2004). Schematic multi-stage evolution proposed for the emplacement of melts at the Guajira Arch during Pangaea assembly and break-up since B) Late Permian C) Middle-Late Triassic D) Jurassic. Late Triassic anatexis may be a response of roll-back extension and crustal attenuation in the upper plate. Significant U-Pb ages, ϵHf_i , and variations in HREE and Y contributions are indicated in ppm and discussed in the text and Table 2.

Exhumation of the Guajira Arch since Middle Jurassic times is evidenced by fission track data collected from the Cosinas group and the mixed provenance signal characterized by Proterozoic, Permo-Triassic, and Jurassic zircons (García-Gonzales et al., 2010; Quintero, 2017; Nova et al., 2019).

At the fore-arc position northwest of the Guajira Arch, the low-grade basal protomylonitic meta-conglomerates of the Jarara Formation (Jf1) yield an age spectrum characterized by Jurassic, Triassic (Carnian), Paleozoic (including Devonian and Ordovician), and Proterozoic inheritance, with a maximum depositional age 157 ± 17.8 Ma. It is indistinguishable from the Sr-isotope and U-Pb maximum depositional ages recovered from the Cosinas group (at ca. 161-157 Ma, Nova, et al., 2019). Furthermore, Carnian (230-220Ma) zircons in Jurassic meta-conglomerates (Jf1) are clear evidence that the anatectic core and intruding granitic suites of the Guajira Arch had to be already exhumed during its protolith deposition as there are not known volcanic sources of ca. 230 Ma nearby (Solari et al., 2011; Spikings and Paul, 2019; López-Isaza and Zuluaga, 2020).

Greenschist facies metamorphism at ca. 157 Ma of the Jarara basal meta-conglomerates may be interpreted as a product of continued extension (Fig. 18D) to judge from top to NW sinistral shear kinematic markers, also observed at the underlying high-amphibolite facies Triassic mylonites (Ug1, Ug3; Fig. 6). Similar Late Jurassic meta-sediments are documented at the Cajamarca complex at the Central Cordillera, consisting of schists and amphibolites (Blanco-Quintero et al., 2014; Rodríguez-García et al., 2020), although their structural relations remain unknown.

During the Late Jurassic, a waning magmatic arc along western Gondwana is evidenced by post-rift plutons. At the Guajira Arch, their ages comprise the youngest ages of the Siapana Granodiorite ca. 158 ± 0.6 Ma (Rodríguez-García et al., 2020); evidencing contemporaneous magmatism exhumation and sedimentation in north-western Gondwana, coeval with the drifting between Gondwana to the south and Chortis-Mexico block in North and Central America (Pindell and Kennan, 2009; Cochrane et al., 2014a).

6. CONCLUSIONS

1) The Guajira Arch Proterozoic basement shows a geochronological and isotopic affinity with Proterozoic inliers of the northern Andes and the Proterozoic basement of the southern Chiapas massif and Oaxaquia, sustaining a scenario of a conjugate margin during Rodinia assembly.

2) During Permian times, the Proterozoic basement was affected by mafic intrusions ca. 270 Ma, correlative in age to meta-granitoids and mafic intrusions documented at the Santa Marta massif, Central Cordillera of Colombia, and the southern Chiapas Massif, evidencing a continuous magmatic arc through western Pangaea.

3) Triassic metamorphism at ca. 230 Ma occurred due to anatexis under an extensional regime as evidenced by Hf_i T_{DM} ages that indicate reworking of the Proterozoic lower crust by incorporation of juvenile material sourced from the asthenospheric mantle. Depletion in LILE, HREE, and low Th/U ratios indicates that contributions from water-light and incompatible elements from a subducting lithosphere were negligible during Triassic, fitting to a diminished convergence and slab steepening during the first stages of Pangaea breakup.

4) Metamorphism at high amphibolite facies and anatexis that originated the migmatites, and afterward, the amphibolites and mylonites found at the Guajira Arch may correspond to the emplacement of a cordilleran core-complex during roll-back extension of the upper plate. Rejuvenated Triassic crust at the core is flanked by mylonitic detachments defining a dome structure.

5) Given the $T_{DM(Hf_i)}$ ages of the Triassic metamorphic rocks indicating melting of a Proterozoic Gondwanan crust, assembly of allochthonous or para-autochthonous terranes is thus no longer necessary to explain the structural setting of the metamorphic complex of the Guajira Arch that is instead explained as *in-situ* anatexis of the lower crust.

6) Renewed convergence between the proto-Pacific plate and NW Gondwana during the Jurassic is evidenced by the emplacement of large volumes of magma enriched in LILE, HREE, U, and Th, along with a juvenile ϵHf composition. An attenuated crust in a near trench position reflects compositional variations due to mixing from subducted sediment, remelting of oceanic crust, lower arc crust, slab-derived fluids, and isotopically juvenile asthenospheric mantle during the establishment of a continental low-lying magmatic arc setting after western Pangaea break-up.

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Appendix 1. Methods

U-Pb Geochronology dating by Laser ablation inductively coupled plasma mass spectrometry on zircons (LA-ICP-MS)

We obtained U-Pb ages from 11 samples (Table 1), zircon crystals were extracted using standard mineral separation techniques, including rock crushing, sieving (430-60 μm fraction), and mineral concentration by means of magnetic and heavy liquids separation. About 50 to 200 clean, crack- and inclusion-free zircon grains per sample were mounted with epoxy, polished, and coated with graphite.

Cathodoluminescence imagery for samples (B-235, B-245, C-172, G-52a, G-52d, G-54, G-55b, G-95) was acquired using a Gatan MiniCl mounted on a JEOL JSM IT-300-LV scanning electron microscope at the Colombian Geological Survey in Bogotá.

For samples (GC-021, GC-061) Panchromatic cathodoluminescence imagery was performed at the ETHZ, using a Vega ©Tescan MV2300VP SEM in order to create a detailed set of images which served to define laser ablation spots both in grain cores and rims.

We performed zircon U-Pb geochronology and in-situ trace element analyses for 7 of the samples at the ETH Zürich (GC-021, GC-061, G-52a, G-52d, G-54, G-55b, G-95). Zircon U-Pb geochronology was performed by laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) using an ASI RESolution S-155 193 nm ArF excimer laser ablation system coupled to a Thermo Scientific Element XR sector-field ICP-MS (Guillong et al., 2014; Von Quadt et al., 2016).

We used a laser output energy of ca. 2 J/cm², repetition rate of 5 Hz and spot diameter of 30 μm . The ablation was performed in the dual-volume, Laurin Technic S-155

ablation cell under a Helium flow of 0.7 L/min. Argon (ca. 1 L/min) was admixed to the aerosol within the funnel of the ablation cell to transport the ablated material to the ICP for ionization. The ICP-MS instrument was optimized for maximum sensitivity on the high mass range and minimum oxide generation ($\text{ThO}^+/\text{Th}^+ < 0.3\%$). A typical analysis consisted of 30 s baseline acquisition followed by 30 seconds of ablation. Trace element and U-Th-Pb isotopes were acquired within a single mass cycle on peak hopping mode, using short dwell times of 5 ms for most trace elements except for ^{49}Ti (20 ms), and longer dwell times for ^{206}Pb (30 ms), ^{207}Pb (30 ms), ^{235}U (20 ms), ^{232}Th (20 ms) and ^{238}U (20 ms) ensuring better counting statistics for dating.

Data were processed offline with the IGOR-based Iolite v.2.5 software (Paton et al., 2011), using the built-in data reduction scheme for trace elements and VizualAge (Petrus and Kamber, 2012) for U-Pb dating. Both data were obtained on the same signal integration intervals, ensuring that reported U-Pb dates and trace element concentrations correspond to the same zircon volume. Data from spots with anomalously elevated Al, P, Ca, Mn or Fe intensities were discarded as these values indicate the presence of mineral (e.g. apatite, feldspar) or melt inclusions. For trace elements, the stoichiometric Si concentration of 15.2 wt.% of zircon was used as an internal standard; quantification and instrumental drift correction were performed by normalization to the NIST SRM610 glass (Jochum et al., 2011) measured twice every 25 zircon analyses. For U-Pb dating, background-subtracted intensities were used to calculate isotope ratios, which were corrected for laser-induced Pb/U fractionation (Paton et al., 2010), instrumental mass discrimination, and drift by conventional standard-sample bracketing, against the primary zircon reference material GJ-1 (Jackson et al., 2004). The accuracy of the corrections was controlled by repeated measurements of secondary reference zircons 91500 (Wiedenbeck et al., 1995), Temora

(Black et al., 2003), Plešovice (Sláma et al., 2008), AusZ7.5 (Von Quadt et al., 2016) and SA2 (A. von Quadt, personal communication). All reference materials yield ages that agree within uncertainties to the reference values (see Supplementary Data, Table A1).

The remaining samples (B-235, B-245, C-172) were analyzed at the Colombian Geological Survey U-Pb geochronology laboratory selecting 60 to 80 zircons per sample. Radiometric dating was carried out following the protocols of the geochronology laboratory of the Colombian Geological Survey (Peña Urueña et al., 2018) using the Laser Ablation – Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) method with a Thermo Scientific Element II single-collector ICP-MS coupled to a 193 nm Photon machine laser ablation system. The analytical conditions of the system were: maximum value of laser output energy 95%, the energy of 7.00 mJ, 8 Hz pulse repetition rate was used. and 126 shots per analysis, the ablation with a 25 μm spot was performed under helium flows of 0.100 L/min and 0.200 L/min, taking a total time of 1 min 5s, during which for 30 s run a target and then acquiring the masses ^{202}Hg , ^{204}Hg , ^{206}Pb , ^{207}Pb , ^{208}Pb , ^{232}Th , ^{235}U , and ^{238}U ; The reference materials are NIST610 glass to maximize the signal of Th and U by optimizing ICP-MS and Laser parameters, oxide generation was optimized at $\text{ThO}^+/\text{Th}^+=<0.5\%$. The Plesovice zircon as the primary standard for the correction of isotopic ratios of 337.13 ± 0.37 Ma (Sláma et al., 2008), and each one of the secondary zircon standards of 91500 CA-ID-TIMS $^{207}\text{Pb}/^{206}\text{Pb}$ age 1062.4 ± 0.8 Ma (Wiedenbeck et al., 1995) and Mount Dromedary 99.12 ± 0.14 Ma (Renne et al., 1998).

Data reduction was performed with the IGOR-based Iolite v2.5 (Paton et al., 2011) and Vizual Age (Petrus and Kamber, 2012). Obtained isotope ratios and dates were corrected for mass bias, instrumental drift, and downhole fractionation using primary reference material. To carry out the manual integrations, the isotopes of ^{238}U , ^{206}Pb , and

^{204}Pb were used. Finally, the Concordia diagrams and data analysis presented are made only with data that have a percentage of discordance <10% for the systems $^{206}\text{Pb}/^{238}\text{U}$ vs. $^{207}\text{Pb}/^{206}\text{Pb}$, for crystals older than 200 Ma whereas for crystals younger than 200 Ma we used the $^{206}\text{Pb}/^{238}\text{U}$ vs. $^{207}\text{Pb}/^{235}\text{U}$ ratios.

Discordant ages arise from common Pb contamination either from inclusions or cracks, recent Pb-loss, or measuring different age domains in the grain leading to mixed ages. Isotopic ratio uncertainties reported in supplementary Table A1 have propagated uncertainties at the 95% confidence level. The total external error on pooled analyses used to calculate dates, estimated to be ~ 2 % for $^{206}\text{Pb}/^{238}\text{U}$ dates, is composed of the systematic uncertainties resulting from (1) uncertainty of the decay constants of ^{238}U and ^{235}U (0.05% and 0.07% respectively; Jaffey et al., 1971) (2) the uncertainty on the $^{206}\text{Pb}/^{238}\text{U}$ ratio of the primary standard (GJ-1 and Plesovice respectively), (3) uncertainty on the $^{238}\text{U}/^{235}\text{U}$ ratio (0.033%; Heiss et al., 2012) and (4) the long-term excess scatter of validation reference materials. Crystallization ages were calculated with 95% confidence and total uncertainties are given, including quadratically propagated external error as suggested in Horstwood et al. (2016). The external error-corrected ages are reported in supplementary Table A1, in which all uncertainties are reported at the 2s level. Statistical analyses of zircon data Concordia and KDE plots were performed using IsoplotR (Vermeesch, 2018). All discordant (> 10%) results of magmatic zircons were discarded.

Zircon Lu-Hf analyses by Laser ablation multi-collection inductively coupled plasma mass spectrometry (LA-MC-ICP-MS)

Zircon Lu-Hf isotopic analyses were carried out by LA-MC-ICP-MS at ETHZ using an ASI RESolution S-155 193 nm ArF excimer laser ablation system attached to a Nu Instruments Nu Plasma 2 multi-collector sector-field mass spectrometer. We used a laser

spot diameter of 50 μm , a repetition rate of 5 Hz, and an energy density of $\sim 4 \text{ J/cm}^2$. The carrier gas consisted of high-purity helium ($\sim 0.35 \text{ L/min}$) and argon ($\sim 1.0 \text{ L/min}$). The integration time was set to 0.5 s and the detector array set to collect intensities for the following isotopes: ^{171}Yb (L4), ^{173}Yb (L2), ^{175}Lu (C), ^{176}Hf (H1), ^{177}Hf (H2), ^{178}Hf (H3), ^{179}Hf (H4), ^{180}Hf (H5) and ^{181}Ta (H6). The data were processed offline with the Igor Pro-based Iolite v2.5 software using an in-house data reduction scheme. Instrumental mass bias for Yb and Hf isotopes were corrected to the natural abundance ratios $^{173}\text{Yb}/^{171}\text{Yb}$ and $^{179}\text{Hf}/^{177}\text{Hf}$ from (Chu et al., 2002). The isobaric interferences of ^{176}Yb and ^{176}Lu on ^{176}Hf were corrected using the natural abundance ratios of $^{176}\text{Yb}/^{173}\text{Yb} = 0.79502$ and $^{176}\text{Lu}/^{175}\text{Lu} = 0.02656$. Accuracy and external reproducibility of the method was controlled by repeated analyses of reference zircon standards GJ-1 (Morel et al., 2008), Plešovice (Sláma et al., 2008), MudTank and Temora (Woodhead and Hergt, 2005). The $^{176}\text{Hf}/^{177}\text{Hf}$ ratios obtained on all reference materials are within 2s uncertainties identical to the recommended values. Calculations of initial $^{176}\text{Hf}/^{177}\text{Hf}$ ratios, εHf_i and depleted mantle Hf model ages (T_{DM}) were performed using a ^{176}Lu decay constant of 1.867×10^{-11} (Scherer et al., 2001) with $^{176}\text{Hf}/^{177}\text{Hf} = 0.0336$ and $^{176}\text{Lu}/^{177}\text{Hf} = 0.282785$ values for the chondritic uniform reservoir (CHUR) recommended by (Bouvier et al., 2008). Depleted mantle reservoir values were estimated according to $^{176}\text{Hf}/^{177}\text{Hf}_{\text{DM}}(0) = 0.28325$ (Salters and Stracke, 2004) and $^{176}\text{Lu}/^{177}\text{Hf}_{\text{DM}}(0) = 0.0388$ (Griffin et al., 2000). The T_{DM2} was calculated from the initial Hf composition of the zircons using an average crustal $^{176}\text{Lu}/^{177}\text{Hf}_{\text{crust, today}} = 0.015$ (Griffin et al., 2002). Measured $^{176}\text{Lu}/^{177}\text{Hf}$ was corrected by multiplying the measured value by the ratio of the natural abundance of both isotopes.

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TABLE A1. U, Pb AND Th ISOTOPIC DATA OBTAINED USING THE LA-ICP-MS METHOD																					
I.D.	Target	Th (ppm)	U (ppm)	Th/U	Isotopic Ratios								Rho		Isotopic Ages						Concordance %
					²⁰⁷ Pb/ ²³⁵ U	±2σ _{sys}	±2σ _{sys} %	²⁰⁶ Pb/ ²³⁸ U	±2σ _{sys}	±2σ _{sys} %	Pb ²⁰⁷ /Pb ²⁰⁶	±2σ _{sys}	±2σ _{sys} %	206/238-207/235	²⁰⁷ Pb/ ²³⁵ U	±2σ _{sys}	²⁰⁶ Pb/ ²³⁸ U	±2σ _{sys}	Pb ²⁰⁷ /Pb ²⁰⁶	±2σ _{sys}	
G-52a - 60	0	11100	6440	1.80	0.9200	0.1400	15.22	0.0252	0.0021	8.33	0.2610	0.0260	9.96	0.98	646	71	160.1	13	3200	150	24.78
G-52a - 48	1	681	3610	0.20	1.7200	0.1600	9.30	0.0412	0.0035	8.50	0.3010	0.0150	4.98	0.86	1005	62	260	22	3459	76	25.87
G-52a - 6	0	3100	3590	0.28	1.1100	0.1100	9.91	0.0342	0.0029	8.48	0.2390	0.0220	9.21	0.33	751	54	217	18	3070	160	28.89
G-52a - 51	0	1368	7600	0.20	0.6920	0.0690	9.97	0.0244	0.0019	7.80	0.2050	0.0190	9.27	0.19	530	40	155.2	12	2830	150	29.28
G-52a - 7	1	927	8380	0.13	0.5480	0.0280	5.11	0.0210	0.0017	8.11	0.1888	0.0019	1.01	0.93	443	19	133.6	10	2731	17	30.16
G-52a - 41	1	233	3470	0.08	0.9680	0.0790	8.16	0.0329	0.0026	7.89	0.2090	0.0100	4.78	0.92	684	42	208.9	17	2880	86	30.54
G-52a - 30	0	2770	4570	0.60	0.8660	0.0810	9.35	0.0303	0.0023	7.60	0.2020	0.0140	6.93	0.67	628	43	192.2	14	2810	110	30.61
G-52a - 55	0	33.5	2330	0.02	0.9900	0.1400	14.14	0.0344	0.0029	8.43	0.2050	0.0220	10.73	0.95	687	77	218.1	18	2800	200	31.75
G-52a - 8	0	506	5340	0.11	0.6780	0.0520	7.67	0.0298	0.0023	7.73	0.1630	0.0082	5.03	0.80	523	31	189.1	15	2467	89	36.16
G-52a - 29	1	637	4200	0.17	0.5810	0.0530	9.12	0.0272	0.0022	8.08	0.1503	0.0078	5.19	0.91	463	34	173.1	14	2334	91	37.39
G-52a - 13	0	134	3060	0.05	0.6760	0.0700	10.36	0.0306	0.0024	7.83	0.1570	0.0120	7.64	0.76	520	44	194.6	15	2390	150	37.42
G-52a - 16	0	2070	8580	0.27	0.4050	0.0260	6.42	0.0203	0.0016	7.89	0.1419	0.0062	4.37	0.28	344	19	129.5	10	2238	72	37.65
G-52a - 56	1	519	3910	0.15	0.6000	0.0590	9.83	0.0091	0.0026	8.64	0.1432	0.0091	6.35	0.79	473	38	191.3	16	2230	130	40.44
G-52a - 23	0	1386	6960	0.22	0.4740	0.0250	5.27	0.0257	0.0020	7.79	0.1305	0.0035	2.68	0.48	394	17	163.3	13	2099	47	41.45
G-52a - 9	1	641	4340	0.17	0.4680	0.0350	7.48	0.0260	0.0021	8.09	0.1301	0.0051	3.92	0.70	389	24	165.2	13	2091	68	42.47
G-52a - 33	1	230	5300	0.05	0.5100	0.0500	9.80	0.0280	0.0021	7.49	0.1310	0.0130	9.92	0.26	415	33	178.3	13	2030	160	42.96
G-52a - 57	0	156	2300	0.07	0.4600	0.1200	26.09	0.0278	0.0024	8.63	0.1350	0.0340	25.19	0.97	403	93	176.8	15	1910	290	43.87
G-52a - 42	1	266	3810	0.08	0.5400	0.0610	11.30	0.0302	0.0024	7.95	0.1280	0.0120	9.38	0.64	435	40	191.8	15	2020	170	44.09
G-52a - 11	0	446	4630	0.11	0.5210	0.0360	6.91	0.0299	0.0024	8.04	0.1235	0.0057	4.62	0.50	424	24	189.7	15	1991	80	44.74
G-52a - 50	0	454	5500	0.09	0.4420	0.0220	4.98	0.0265	0.0020	7.55	0.1208	0.0017	1.41	0.87	371.5	15	168.4	13	1967	26	45.33
G-52a - 40	0	349	4590	0.08	0.5060	0.0970	19.17	0.0298	0.0026	8.72	0.1180	0.0190	16.10	0.81	405	62	189.1	16	1800	260	46.69
G-52a - 10	0	787	6140	0.14	0.3930	0.0250	6.36	0.0249	0.0020	8.04	0.1127	0.0037	3.28	0.64	336	18	158.5	12	1836	59	47.17
G-52a - 22	1	631	4100	0.18	0.4260	0.0280	6.57	0.0281	0.0022	7.84	0.1066	0.0040	3.75	0.65	359	20	178.4	14	1732	67	49.69
G-52a - 47	0	342	4290	0.09	0.4430	0.0390	8.80	0.0296	0.0024	8.11	0.1082	0.0065	6.01	0.54	371	27	188	15	1750	100	50.67
G-52a - 38	1	77.2	1513	0.06	0.4530	0.0230	5.08	0.0303	0.0023	7.58	0.1077	0.0026	2.41	0.34	379.4	16	192.6	14	1757	43	50.76
G-52a - 15	1	481	4350	0.12	0.3890	0.0280	7.20	0.0269	0.0020	7.44	0.1030	0.0053	5.15	0.46	333	20	170.9	13	1654	95	51.32
G-52a - 21	1	206	4000	0.06	0.3970	0.0430	10.83	0.0287	0.0022	7.68	0.0977	0.0080	8.19	0.68	336	31	182.1	14	1520	150	54.20
G-52a - 34	1	428	3220	0.13	0.3860	0.0260	6.74	0.0284	0.0023	8.09	0.0957	0.0041	4.28	0.51	330	19	180.7	14	1539	83	54.76
G-52a - 1	0	517	3315	0.15	0.3410	0.0190	5.57	0.0265	0.0020	7.56	0.0948	0.0038	4.01	0.11	297.9	14	168.4	13	1511	72	56.53
G-52a - 52	0	281	3490	0.09	0.3610	0.0200	5.54	0.0278	0.0021	7.55	0.0937	0.0023	2.45	0.75	312	15	176.9	13	1497	48	56.70
G-52a - 17	1	540	6870	0.09	0.3188	0.0170	5.33	0.0256	0.0020	7.81	0.0882	0.0030	3.40	0.03	280.7	13	163	12	1377	62	58.07
G-52a - 44	0	417	2840	0.16	0.3520	0.0180	5.11	0.0287	0.0022	7.67	0.0879	0.0027	3.07	0.11	305.8	13	182.4	14	1372	57	59.65
G-52a - 4	1	9000	44300	0.15	0.1098	0.0110	10.02	0.0102	0.0012	11.75	0.0803	0.0024	2.99	0.91	105.6	9.7	65.5	7.6	1197	59	62.03
G-52a - 18	1	61.6	1250	0.06	0.2790	0.0430	15.41	0.0251	0.0019	7.56	0.0772	0.0098	12.69	0.80	246	33	160.1	12	1020	220	65.08
G-52a - 39	0	210	2490	0.07	0.2776	0.0140	5.04	0.0273	0.0021	7.70	0.0723	0.0023	3.18	0.17	248.6	11	173.3	13	981	62	69.71
G-52a - 49	0	54.4	5650	0.01	0.3020	0.0380	12.58	0.0295	0.0023	7.80	0.0739	0.0089	12.04	0.48	265	29	187.4	14	920	230	70.72
G-52a - 37	1	86.6	3770	0.03	0.2470	0.0150	6.07	0.0275	0.0021	7.64	0.0637	0.0023	3.61	0.62	224.1	12	174.7	13	719	76	77.96
G-52a - 59	0	110	3580	0.03	0.2395	0.0120	5.01	0.0269	0.0020	7.44	0.0642	0.0020	3.12	0.05	217.9	9.9	171	13	755	69	78.48
G-52a - 14	0	174	2620	0.06	0.2380	0.0210	8.82	0.0269	0.0020	7.45	0.0631	0.0040	6.34	0.57	216	17	170.9	13	670	130	79.12
G-52a - 35	0	91	1776	0.04	0.2441	0.0120	4.92	0.0279	0.0021	7.52	0.0623	0.0012	1.93	0.43	221.6	9.6	177.5	13	679	41	80.10
G-52a - 58	1	145	3050	0.05	0.2270	0.0150	6.61	0.0265	0.0020	7.56	0.0626	0.0025	3.99	0.47	207.6	12	168.4	13	678	87	81.12
G-52a - 27	0	78.8	3340	0.03	0.2194	0.0110	5.01	0.0258	0.0020	7.75	0.0599	0.0011	1.84	0.72	201.3	9	164.2	12	595	38	81.57
G-52a - 28	0	83.9	2270	0.04	0.2279	0.0130	5.70	0.0268	0.0020	7.47	0.0602	0.0022	3.65	0.18	208.3	11	170.2	13	597	79	81.71
G-52a - 43	0	407	3380	0.14	0.2483	0.0120	4.83	0.0290	0.0022	7.59	0.0612	0.0013	2.12	0.54	225.1	10	184.2	14	643	46	81.83
G-52a - 36	0	64	1446	0.03	0.2268	0.0130	5.73	0.0275	0.0021	7.63	0.0585	0.0024	4.10	0.00	207.3	11	175.1	13	530	94	84.47
G-52a - 45	1	259	6270	0.04	0.1998	0.0120	6.01	0.0249	0.0019	7.62	0.0576	0.0020	3.47	0.63	184.8	9.9	158.7	12	502	74	85.88
G-52a - 3	0	139.3	4520	0.03	0.2184	0.0100	4.58	0.0272	0.0021	7.73	0.0605	0.0005	0.88	0.84	200.5	8.4	172.7	13	621	19	86.13
G-52a - 20	1	68	2990	0.02	0.1950	0.0130	6.67	0.0249	0.0019	7.63	0.0543	0.0024	4.42	0.06	180.7	11	158.5	12	400	100	87.71
G-52a - 32	1	28	2431	0.01	0.2096	0.0120	5.73	0.0273	0.0021	7.69	0.0545	0.0015	2.75	0.59	193.1	9.7	173.7	13	382	61	89.95
G-52a - 26	1	51.4	2320	0.03	0.2169	0.0100	4.61	0.0289	0.0022	7.60	0.0529	0.0010	1.80	0.59	199.3	8.5	183.8	14	321	41	92.22
G-52a - 24	1	36.8	4650	0.01	0.1962	0.0110	5.61	0.0267	0.0020	7.49	0.0517	0.0016	3.09	0.61	181.8	9.1	169.8	13	264	70	93.40
G-52a - 54	1	16.16	2008	0.01	0.2014	0.0090	4.47	0.0279	0.0021	7.52	0.0526	0.0007	1.39	0.72	186.3	7.6	177.6	13	315	35	95.33
G-52a - 31	1	34.8	5090	0.01	0.1909	0.0084	4.40	0.0266	0.0020	7.52	0.0510	0.0005	1.00	0.67	177.4	7.2	169.2	13	239	23	95.38
G-52a - 25	1	36.8	4900	0.01	0.1857	0.0084	4.52	0.0261	0.0020	7.66	0.0503	0.0005	1.01	0.79	172.9	7.2	166.2	13	208	23	96.12
G-52a - 46	0	27.2	2290	0.01	0.1885	0.0085	4.51	0.0266	0.0020	7.52	0.0509	0.0008	1.63	0.45	175.3	7.2	169.2	13	231	38	96.52

G-55b - 1	0	288	1228	0.27	0.9760	0.0480	4.92	0.0987	0.0074	7.50	0.0723	0.0012	1.66	0.84	691	25	606.7	44	993	34	61.10
G-55b - 52	0	44	117.2	0.42	0.4900	0.0390	7.96	0.0600	0.0051	8.50	0.0603	0.0032	5.31	0.63	404	27	376	31	600	120	62.67
G-55b - 6	0	14.56	53.1	0.31	1.2060	0.0750	6.22	0.1147	0.0089	7.76	0.0774	0.0027	3.49	0.47	806	32	700	51	1114	72	62.84
G-55b - 75	1	94.8	771	0.13	0.3240	0.0190	5.86	0.0422	0.0032	7.58	0.0556	0.0018	3.24	0.51	284.6	14	266.5	20	423	70	63.00
G-55b - 22	0	110	69.4	1.79	0.9020	0.0560	6.21	0.0948	0.0073	7.70	0.0698	0.0027	3.87	0.24	650	30	584	43	906	79	64.46
G-55b - 56	0	133.6	461	0.33	1.2080	0.0710	5.88	0.1173	0.0091	7.76	0.0758	0.0030	3.96	0.63	803	32	715	53	1081	75	66.14
G-55b - 71	1	12.07	1177	0.01	0.3288	0.0150	4.56	0.0433	0.0033	7.62	0.0550	0.0012	2.18	0.32	288.6	12	273.2	21	406	51	67.29
G-55b - 38	1	342	538	0.72	0.3285	0.0160	4.87	0.0434	0.0033	7.60	0.0548	0.0011	2.01	0.45	288.3	12	273.9	20	400	46	68.48
G-55b - 25	0	51.1	83.4	0.69	2.5200	0.1700	6.75	0.1859	0.0150	8.07	0.0987	0.0043	4.36	0.50	1273	49	1099	79	1586	80	69.29
G-55b - 36	0	146.6	1523	0.11	0.2955	0.0140	4.74	0.0398	0.0030	7.53	0.0537	0.0009	1.60	0.60	262.8	11	251.8	19	354	36	71.13
G-55b - 54	1	84	1970	0.05	0.3132	0.0160	5.11	0.0314	0.0024	7.64	0.0724	0.0022	3.04	0.19	276.5	12	199.3	15	988	60	72.08
G-55b - 55	0	73.8	137.9	0.60	1.3800	0.0820	5.94	0.1297	0.0100	7.71	0.0757	0.0021	2.77	0.66	878	34	786	59	1079	53	72.85
G-55b - 32	1	325	2696	0.13	0.2882	0.0150	5.20	0.0296	0.0023	7.78	0.0708	0.0024	3.39	0.16	256.9	12	187.8	14	937	68	73.10
G-55b - 24	1	22.3	140.8	0.18	0.6430	0.0440	6.84	0.0586	0.0046	7.85	0.0790	0.0038	4.81	0.17	502	27	367.2	28	1150	95	73.15
G-55b - 72	0	85.9	140.5	0.69	6.7100	0.3200	4.77	0.3142	0.0250	7.96	0.1524	0.0017	1.12	0.89	2073	43	1761	120	2380	23	73.99
G-55b - 5	1	20.4	70.6	0.33	0.9960	0.0640	6.43	0.1066	0.0085	7.97	0.0688	0.0027	3.92	0.57	700	32	653	49	880	82	74.20
G-55b - 48	0	16.8	74.3	0.25	0.9640	0.0660	6.85	0.1028	0.0080	7.78	0.0678	0.0032	4.72	0.62	684	34	631	47	849	93	74.32
G-55b - 68	1	177	3040	0.07	0.2600	0.0110	4.23	0.0358	0.0027	7.55	0.0522	0.0005	1.03	0.68	234.6	9.3	226.6	17	294	24	77.07
G-55b - 30	1	62	214	0.33	0.3620	0.0270	7.46	0.0481	0.0039	8.11	0.0549	0.0027	4.92	0.63	313	20	302.7	24	390	110	77.62
G-55b - 66	1	124.9	125.8	1.10	0.2900	0.0190	6.55	0.0393	0.0030	7.63	0.0533	0.0024	4.50	0.40	258	15	248.6	19	320	96	77.69
G-55b - 27	0	71.8	46.8	1.68	0.2630	0.0710	27.00	0.0282	0.0024	8.51	0.0670	0.0170	25.37	0.18	228	51	179.5	15	510	390	78.73
G-55b - 34	0	273.6	265.2	1.17	2.0680	0.0970	4.69	0.1778	0.0140	7.87	0.0846	0.0012	1.42	0.74	1137	32	1054	75	1304	27	80.83
G-55b - 80	1	64.7	214	0.34	1.2180	0.0680	5.58	0.1272	0.0098	7.70	0.0709	0.0024	3.39	0.36	808	31	772	56	948	70	81.43
G-55b - 69	0	158	229.1	0.76	0.6220	0.0330	5.31	0.0761	0.0057	7.49	0.0596	0.0017	2.85	0.22	490	21	472.5	34	578	63	81.75
G-55b - 21	0	106	350	0.34	0.9870	0.0520	5.27	0.1095	0.0084	7.67	0.0662	0.0017	2.57	0.62	697	26	670	49	806	52	83.13
G-55b - 61	0	45	152.4	0.33	1.8890	0.0930	4.92	0.1701	0.0130	7.64	0.0807	0.0016	1.98	0.72	1076	33	1012	72	1212	39	83.50
G-55b - 82	1	101.7	1001	0.11	0.2928	0.0140	4.78	0.0403	0.0031	7.69	0.0526	0.0012	2.28	0.51	260.6	11	254.7	19	304	49	83.78
G-55b - 13	0	74.4	96.8	0.88	0.2100	0.0190	9.05	0.0253	0.0020	7.90	0.0587	0.0039	6.64	0.47	192	16	161.1	12	550	160	83.91
G-55b - 76	0	24.7	64.4	0.43	1.6850	0.1000	5.93	0.1579	0.0130	8.23	0.0774	0.0025	3.23	0.70	1000	39	945	70	1121	64	84.30
G-55b - 83	0	32.8	738	0.05	0.2932	0.0150	5.12	0.0405	0.0030	7.41	0.0526	0.0014	2.66	0.42	260.9	11	255.8	19	302	59	84.70
G-55b - 15	0	85.7	1248	0.08	1.5810	0.0690	4.36	0.1527	0.0120	7.86	0.0750	0.0008	1.04	0.71	962.6	27	916	65	1068	21	85.77
G-55b - 41	1	281	918	0.34	0.2617	0.0120	4.59	0.0366	0.0028	7.65	0.0517	0.0009	1.82	0.32	235.9	9.5	231.6	17	269	41	86.10
G-55b - 65	0	85.3	114.5	0.82	0.2900	0.0200	6.90	0.0398	0.0031	7.79	0.0526	0.0028	5.32	0.37	258	16	251.7	19	290	110	86.79
G-55b - 59	0	301	569	0.60	0.5690	0.0260	4.57	0.0714	0.0054	7.56	0.0577	0.0010	1.73	0.54	457.3	17	444.5	32	512	38	86.82
G-55b - 20	0	143.3	362	0.45	0.9280	0.0490	5.28	0.1052	0.0081	7.70	0.0640	0.0014	2.19	0.73	665	26	645	47	737	44	87.52
G-55b - 42	0	114.8	97.6	1.34	0.7000	0.0390	5.57	0.0846	0.0065	7.68	0.0603	0.0022	3.65	0.49	541	26	523	39	597	79	87.60
G-55b - 84	0	126	162	0.88	5.5160	0.2500	4.53	0.3212	0.0250	7.78	0.1241	0.0016	1.29	0.83	1902	39	1795	120	2015	22	89.08
G-55b - 43	0	305	1120	0.30	0.6960	0.0380	5.46	0.0846	0.0069	8.16	0.0595	0.0008	1.28	0.93	535	23	523	41	582	28	89.86
G-55b - 62	0	67.8	15.6	4.88	2.0800	0.2500	12.02	0.1870	0.0180	9.63	0.0811	0.0097	11.96	0.83	1127	91	1104	98	1220	210	90.49
G-55b - 35	1	111	559	0.22	0.2719	0.0140	5.15	0.0381	0.0029	7.61	0.0516	0.0011	2.13	0.53	244	11	241.2	18	264	49	91.36
G-55b - 16	0	36.9	104.2	0.40	2.1290	0.1000	4.70	0.1909	0.0140	7.33	0.0815	0.0017	2.09	0.64	1157	33	1126	78	1229	42	91.62
G-55b - 45	1	25.5	202	0.14	0.8060	0.0410	5.09	0.0950	0.0073	7.68	0.0612	0.0014	2.29	0.60	599	23	585	43	638	52	91.69
G-55b - 81	0	84.6	225.3	0.42	1.7220	0.0750	4.36	0.1653	0.0120	7.26	0.0753	0.0011	1.46	0.34	1016.6	28	986	69	1074	29	91.81
G-55b - 67	0	167.9	492	0.39	0.8170	0.0400	4.90	0.0964	0.0073	7.57	0.0613	0.0011	1.79	0.72	606	22	593.3	43	646	37	91.84
G-55b - 26	1	177.2	100.4	1.99	0.2100	0.0150	7.14	0.0279	0.0022	7.88	0.0543	0.0032	5.89	0.03	193	13	177.5	14	360	130	91.97
G-55b - 57	1	5.9	1301	0.00	0.3073	0.0150	4.88	0.0424	0.0032	7.55	0.0522	0.0008	1.53	0.71	271.9	11	267.5	20	290	35	92.24
G-55b - 17	1	12.37	1111	0.01	0.3460	0.0190	5.49	0.0442	0.0034	7.70	0.0572	0.0013	2.27	0.89	301.6	14	278.5	21	492	50	92.34
G-55b - 31	0	93.3	126.8	0.81	0.5440	0.0310	5.70	0.0695	0.0054	7.77	0.0568	0.0021	3.70	0.39	440	20	433.4	33	467	85	92.81
G-55b - 29	0	155.1	317	0.55	2.1000	0.0960	4.57	0.1899	0.0150	7.90	0.0805	0.0012	1.49	0.69	1148	31	1121	79	1207	29	92.87
G-55b - 46	0	30.2	206	0.17	0.7180	0.0390	5.43	0.0872	0.0069	7.91	0.0595	0.0014	2.35	0.70	549	23	539	41	576	52	93.58
G-55b - 4	0	231	299	0.87	26.0600	1.4000	5.37	0.6490	0.0500	7.70	0.2930	0.0042	1.43	0.85	3344	52	3221	200	3432	22	93.85
G-55b - 7	1	85	151.8	0.63	1.6510	0.0840	5.09	0.1629	0.0130	7.98	0.0740	0.0017	2.30	0.58	989	32	973	70	1036	45	93.92
G-55b - 9	0	25	630	0.04	1.6660	0.0730	4.38	0.1639	0.0120	7.32	0.0741	0.0007	0.93	0.82	995.3	28	979	69	1042	19	93.95
G-55b - 23	1	61.8	1050	0.06	0.3150	0.0170	5.40	0.0414	0.0033	7.97	0.0549	0.0014	2.55	0.73	277.7	13	261.5	21	400	58	94.17
G-55b - 14	1	137	253	0.62	0.1705	0.0110	6.45	0.0236	0.0018	7.63	0.0525	0.0025	4.76	0.36	159.6	9.1	150.3	11	280	100	94.17
G-55b - 47	1	43.8	195.9	0.25	0.8090	0.0460	5.69	0.0961	0.0075	7.80	0.0609	0.0017	2.79	0.66	601	26	592	44	627	60	94.42
G-55b - 37	0	240	294	0.92	0.3160	0.0170	5.38	0.0438	0.0034	7.77	0.0524	0.0016	3.05	0.45	278.7	13	276.2	21	291	71	94.91
G-55b - 3	0	52.2	950	0.06	0.6340	0.0290	4.57	0.0800	0.0061	7.63	0.0578	0.0008	1.38	0.66	498.4	18	496	36	521	30	95.20
G-55b - 39	0	58.3	777	0.08	0.8710	0.0390	4.48	0.1019	0.0077	7.56	0.0616	0.0009	1.38	0.57	635.6	21	625.6	45	657		

G-55b - 79	1	95.2	275	0.39	1.6690	0.0860	5.15	0.1684	0.0130	7.72	0.0716	0.0012	1.68	0.75	996	32	1003	73	973	33	103.08
G-55b - 33	0	46.7	86	0.56	0.7000	0.0410	5.86	0.0870	0.0068	7.82	0.0580	0.0025	4.31	0.24	538	25	538	40	507	93	106.11
G-55b - 53	0	32.5	47.1	0.78	0.6820	0.0560	8.21	0.0851	0.0067	7.87	0.0577	0.0036	6.24	0.44	525	33	526	40	480	130	109.58
G-95 - 30		533	4130	0.14	0.6540	0.0310	4.74	0.0698	0.0055	7.88	0.0693	0.0005	0.78	0.94	510.4	19	435	33	908	16	47.91
G-95 - 6		1205000	56500	23.86	1.5210	0.0670	4.40	0.1210	0.0092	7.60	0.0898	0.0009	0.99	0.82	938.4	27	737	53	1421	19	51.86
G-95 - 29		846	3400	0.28	1.0560	0.0500	4.73	0.1025	0.0079	7.71	0.0767	0.0006	0.74	0.92	732	24	629	46	1113	15	56.51
G-95 - 3		694	4160	0.19	1.1900	0.0610	5.13	0.1086	0.0086	7.92	0.0783	0.0005	0.66	0.96	795	28	664	50	1154	13	57.54
G-95 - 33		398	2843	0.15	1.1540	0.0550	4.77	0.1101	0.0084	7.63	0.0766	0.0012	1.57	0.81	778	26	673	49	1109	32	60.69
G-95 - 24		284	2740	0.12	1.2680	0.0740	5.84	0.1200	0.0100	8.33	0.0780	0.0008	1.05	0.96	830	33	730	58	1146	21	63.70
G-95 - 15		307	3060	0.11	1.1630	0.0660	5.67	0.1115	0.0091	8.16	0.0747	0.0009	1.18	0.95	782	31	681	53	1061	24	64.18
G-95 - 21		292.4	2514	0.13	1.2640	0.0560	4.43	0.1223	0.0093	7.60	0.0745	0.0006	0.75	0.83	829.6	25	743	53	1054	15	70.49
G-95 - 28		674	2702	0.28	1.3520	0.0590	4.36	0.1296	0.0098	7.56	0.0764	0.0005	0.64	0.84	868.1	26	785.4	56	1105	13	71.08
G-95 - 35		150	2490	0.07	1.3440	0.0610	4.54	0.1331	0.0100	7.51	0.0744	0.0006	0.81	0.89	864	27	805	59	1052	16	76.52
G-95 - 2		571	2124	0.29	1.7510	0.0870	4.97	0.1553	0.0120	7.73	0.0803	0.0008	1.01	0.93	1026	32	931	67	1204	20	77.33
G-95 - 17		287	2590	0.12	1.4020	0.0630	4.49	0.1349	0.0110	8.15	0.0742	0.0006	0.74	0.94	890	27	815	60	1045	15	77.99
G-95 - 8		745	3325	0.25	1.6840	0.0830	4.93	0.1540	0.0120	7.79	0.0793	0.0005	0.58	0.97	1002	32	923	66	1178	12	78.35
G-95 - 9		685	2410	0.32	1.7220	0.0790	4.59	0.1577	0.0120	7.61	0.0788	0.0008	1.04	0.92	1016	30	944	67	1165	21	81.03
G-95 - 14		245	2478	0.10	1.7480	0.0900	5.15	0.1598	0.0130	8.14	0.0790	0.0015	1.90	0.89	1025	34	955	72	1169	37	81.69
G-95 - 34		148	2950	0.05	1.5550	0.0820	5.27	0.1498	0.0120	8.01	0.0759	0.0005	0.70	0.98	952	33	900	69	1092	14	82.42
G-95 - 5		1285000	56800	25.25	1.4610	0.0650	4.45	0.1423	0.0110	7.73	0.0739	0.0004	0.57	0.82	914	27	857	61	1039	11	82.48
G-95 - 39		152	1690	0.09	1.7880	0.0830	4.64	0.1672	0.0130	7.78	0.0794	0.0005	0.63	0.97	1040	30	996	73	1181	12	84.34
G-95 - 40		240	1976	0.14	1.5260	0.0700	4.59	0.1514	0.0120	7.93	0.0751	0.0007	0.87	0.84	940	28	909	65	1072	17	84.79
G-95 - 4		298	2399	0.10	1.8720	0.0820	4.38	0.1713	0.0130	7.59	0.0783	0.0005	0.64	0.88	1070.7	29	1019	71	1155	13	88.23
G-95 - 16		252	1854	0.14	2.1310	0.0950	4.46	0.1867	0.0140	7.50	0.0815	0.0006	0.75	0.88	1159	31	1103	77	1233	15	89.46
G-95 - 25		127.1	2794	0.05	1.8790	0.0800	4.26	0.1746	0.0130	7.45	0.0782	0.0005	0.59	0.89	1073.5	28	1037	72	1150	12	90.17
G-95 - 1		83.3	2091	0.04	1.8630	0.0830	4.46	0.1730	0.0130	7.51	0.0777	0.0005	0.58	0.88	1067	30	1028	72	1138	11	90.33
G-95 - 7		1321	3066	0.48	2.2460	0.1000	4.45	0.1950	0.0150	7.69	0.0826	0.0005	0.55	0.95	1195	32	1148	82	1258	11	91.26
G-95 - 12		100.7	1785	0.06	1.7900	0.0790	4.41	0.1700	0.0130	7.65	0.0764	0.0006	0.80	0.70	1041.6	29	1012	71	1106	16	91.50
G-95 - 13		51.4	2528	0.02	1.9520	0.0850	4.35	0.1790	0.0140	7.82	0.0778	0.0003	0.44	0.93	1098.7	29	1061	74	1142.1	8.8	92.90
G-95 - 37		286	1610	0.11	2.0290	0.1100	5.42	0.1881	0.0150	7.97	0.0798	0.0009	1.15	0.98	1123	35	1110	81	1190	22	93.28
G-95 - 11		304	551	0.61	2.0940	0.0920	4.39	0.1896	0.0140	7.38	0.0799	0.0007	0.86	0.71	1146.5	30	1119	77	1195	17	93.64
G-95 - 18		119.4	1042	0.13	1.6640	0.0760	4.57	0.1619	0.0120	7.41	0.0735	0.0005	0.68	0.93	995	29	968	69	1026	14	94.35
G-95 - 27		213	2296	0.09	1.8070	0.0810	4.48	0.1747	0.0130	7.44	0.0761	0.0006	0.76	0.92	1048	30	1038	73	1097	15	94.62
G-95 - 26		89	1387	0.07	1.8620	0.0810	4.35	0.1793	0.0140	7.81	0.0762	0.0006	0.79	0.77	1067.6	29	1063	74	1101	16	96.55
G-95 - 20		107.4	827	0.14	1.6690	0.0740	4.43	0.1651	0.0120	7.27	0.0728	0.0005	0.74	0.82	996.5	28	985	69	1008	15	97.72
G-95 - 32		109.4	1474	0.08	1.6750	0.0750	4.48	0.1683	0.0130	7.72	0.0734	0.0005	0.63	0.90	999	28	1003	71	1025	13	97.85
G-95 - 10		99.4	800	0.14	1.8080	0.0840	4.65	0.1742	0.0140	8.04	0.0744	0.0006	0.78	0.93	1048	30	1035	75	1056	14	98.01
G-95 - 23		63.8	1758	0.04	1.9660	0.0900	4.58	0.1862	0.0140	7.52	0.0771	0.0006	0.79	0.81	1103	31	1101	77	1123	16	98.04
G-95 - 19		183	1220	0.16	2.5150	0.1100	4.37	0.2192	0.0170	7.76	0.0842	0.0006	0.68	0.93	1276	33	1278	88	1297	13	98.54
G-95 - 36		92.6	715	0.14	1.5790	0.0700	4.43	0.1630	0.0120	7.36	0.0721	0.0006	0.85	0.78	961.7	28	973.5	68	987	17	98.63
G-95 - 22		99.7	1265	0.09	1.6920	0.0740	4.37	0.1679	0.0130	7.74	0.0730	0.0005	0.74	0.86	1005	28	1000	70	1012	15	98.81
G-95 - 38		875	2274	0.42	2.3140	0.1200	5.19	0.2096	0.0170	8.11	0.0817	0.0006	0.67	0.97	1214	36	1226	89	1237	13	99.11
G-95 - 31		78.6	1456	0.06	2.0510	0.0920	4.49	0.1944	0.0150	7.72	0.0776	0.0005	0.66	0.93	1132	31	1145	81	1137	13	100.70
G-54 - 6	0	28.1	571	0.05	0.3470	0.0130	3.75	0.0421	0.0010	2.38	0.0598	0.0016	2.68	0.70	302.3	9.9	265.5	6.3	591	60	44.92
G-54 - 70	1	24.2	574	0.05	0.4000	0.0200	5.00	0.0477	0.0014	2.94	0.0608	0.0020	3.29	0.78	341	15	300.1	8.9	625	77	48.02
G-54 - 31	0	23.7	849	0.03	0.3435	0.0140	4.08	0.0424	0.0012	2.83	0.0587	0.0016	2.73	0.75	299.7	11	267.9	7.5	551	59	48.62
G-54 - 5	0	38.1	395	0.11	0.7390	0.0550	7.44	0.0768	0.0044	5.73	0.0698	0.0026	3.72	0.87	561	37	477	27	918	94	51.96
G-54 - 18	0	56.4	1146	0.05	0.3920	0.1700	43.37	0.0479	0.0150	31.32	0.0593	0.0025	4.22	0.95	335	88	301	89	575	80	52.35
G-54 - 69	1	25.3	592	0.05	0.4030	0.0190	4.71	0.0495	0.0018	3.64	0.0592	0.0017	2.87	0.79	344	15	311.3	11	566	58	55.00
G-54 - 1	0	53	542	0.11	0.3780	0.0220	5.82	0.0470	0.0018	3.83	0.0582	0.0019	3.26	0.85	325	16	296.2	11	526	74	56.31
G-54 - 88	1	43.1	369	0.13	0.6290	0.0270	4.29	0.0709	0.0021	2.96	0.0644	0.0018	2.80	0.76	495	17	441.3	12	750	61	58.84
G-54 - 2	0	79.8	105.3	0.86	0.3340	0.0210	6.29	0.0434	0.0013	3.00	0.0569	0.0035	6.15	0.28	296	16	274	8.1	450	130	60.89
G-54 - 90	1	12.43	387	0.04	0.2870	0.1900	66.20	0.0381	0.0073	19.16	0.0548	0.0110	20.07	0.64	256	100	241.2	44	388	250	62.16
G-54 - 73	1	11.83	412	0.03	0.2800	0.0130	4.64	0.0373	0.0010	2.68	0.0544	0.0022	4.04	0.50	250	11	235.9	6.5	370	91	63.76
G-54 - 52	1	19.3	407	0.05	0.2580	0.0120	4.65	0.0350	0.0009	2.54	0.0535	0.0021	3.93	0.54	233	9.8	221.7	5.6	340	88	65.21
G-54 - 24	1	113.9	547	0.23	0.3880	0.0130	3.35	0.0497	0.0011	2.21	0.0566	0.0015	2.65	0.61	332.7	9.8	312.6	6.6	470	59	66.51
G-54 - 76	1	8.77	280	0.03	0.2427	0.0110	4.53	0.0333	0.0008	2.46	0.0528	0.0019	3.60	0.61	220.4	9.2	211.4	5.1	310	89	68.19
G-54 - 29	1	10.87	1039	0.01	0.3600	0.2700	75.00	0.0312	0.0035	11.22	0.0770	0.0300	38.96	0.96	290	130	198	22	690	420	68.28
G-54 - 55	1	19.4	674	0.03	0.2893	0.0240	8.30	0.0393	0.0023	5.85	0.0535	0.0016	2.99	0.97	257.9	18	248.7	14	347	64	71.67
G-54 - 85	0	126.1	241	0.58	0.7360	0.0370	5.03	0.0837	0.0021	2.51											

G-54 - 28	0	80.1	543	0.16	1.9180	0.0610	3.18	0.1687	0.0039	2.31	0.0825	0.0017	2.06	0.76	1086	21	1005	22	1255	39	80.08
G-54 - 89	0	86.4	161.2	0.60	9.4800	0.3400	3.59	0.3877	0.0110	2.84	0.1779	0.0040	2.25	0.78	2384	35	2112	50	2632	38	80.24
G-54 - 20	0	35.9	228	0.18	0.4130	0.0220	5.33	0.0538	0.0016	2.97	0.0557	0.0023	4.13	0.64	350	15	337.8	9.5	420	86	80.43
G-54 - 66	1	24.2	1030	0.03	0.3260	0.0390	11.96	0.0444	0.0041	9.23	0.0535	0.0015	2.80	0.70	286	27	280.1	25	348	57	80.49
G-54 - 14	0	260	397	0.62	0.3050	0.0150	4.92	0.0417	0.0010	2.40	0.0532	0.0021	3.95	0.61	270.4	12	263.5	6.4	321	86	82.09
G-54 - 65	1	7.39	715	0.01	0.2584	0.0094	3.64	0.0361	0.0009	2.58	0.0520	0.0015	2.88	0.62	233.2	7.5	228.6	5.8	278	66	82.23
G-54 - 21	0	96.8	261	0.41	10.9700	0.3200	2.92	0.4193	0.0094	2.24	0.1899	0.0035	1.84	0.78	2520	28	2257	43	2741	30	82.34
G-54 - 62	1	69	585	0.11	0.2696	0.0100	3.71	0.0375	0.0009	2.27	0.0522	0.0017	3.26	0.49	242.2	8.4	237.4	5.3	287	74	82.72
G-54 - 46	0	103.1	430	0.27	0.2521	0.0100	3.97	0.0353	0.0008	2.27	0.0519	0.0017	3.28	0.56	228.1	8.3	223.4	5	270	73	82.74
G-54 - 67	0	66.5	673	0.11	0.4600	0.0150	3.26	0.0596	0.0013	2.18	0.0561	0.0014	2.50	0.64	384.1	11	372.9	8.1	450	55	82.87
G-54 - 13	1	153	431	0.32	0.2852	0.0120	4.21	0.0395	0.0010	2.53	0.0525	0.0018	3.43	0.58	254.6	9.2	249.4	6.3	298	75	83.69
G-54 - 74	0	58.9	185.2	0.36	1.7020	0.0620	3.64	0.1592	0.0041	2.58	0.0777	0.0020	2.57	0.71	1008	23	952	23	1133	51	84.02
G-54 - 64	0	70.3	288	0.27	0.4960	0.0210	4.23	0.0639	0.0016	2.50	0.0563	0.0019	3.37	0.60	408	14	399	9.8	473	66	84.36
G-54 - 82	1	8.52	1089	0.01	0.2464	0.0087	3.53	0.0348	0.0008	2.42	0.0515	0.0013	2.52	0.70	223.6	7	220.2	5.3	258	58	85.35
G-54 - 47	1	71.6	327	0.24	0.2461	0.0120	4.88	0.0346	0.0010	2.89	0.0517	0.0022	4.26	0.50	223.1	9.7	219.5	6.4	256	91	85.74
G-54 - 16	0	413	553	0.83	0.2806	0.0096	3.42	0.0390	0.0010	2.43	0.0522	0.0014	2.68	0.63	251	7.6	246.8	5.9	287	61	85.99
G-54 - 77	0	95.4	89	1.20	1.6320	0.1400	8.58	0.1566	0.0120	7.66	0.0757	0.0024	3.17	0.93	981	65	938	67	1080	68	86.85
G-54 - 43	1	11.62	401	0.03	0.2640	0.0110	4.17	0.0370	0.0010	2.70	0.0518	0.0017	3.28	0.62	237.4	8.9	234.1	6.5	269	72	87.03
G-54 - 11	1	7.37	294	0.03	0.2458	0.0110	4.48	0.0346	0.0010	2.89	0.0515	0.0019	3.69	0.57	222.9	9.3	219.5	6.3	252	80	87.10
G-54 - 91	0	53.5	240	0.25	7.0300	0.2900	4.13	0.3581	0.0110	3.07	0.1424	0.0028	1.97	0.89	2113	35	1972	52	2256	34	87.41
G-54 - 40	1	10.4	289	0.04	0.2530	0.0120	4.74	0.0357	0.0009	2.38	0.0516	0.0023	4.46	0.37	228.7	9.9	225.9	5.3	258	98	87.56
G-54 - 25	0	55.5	820	0.08	0.2707	0.0100	3.69	0.0379	0.0010	2.61	0.0519	0.0014	2.70	0.68	243	8.1	239.6	6.1	273	61	87.77
G-54 - 79	1	150	3500	0.04	0.2930	0.0093	3.17	0.0410	0.0011	2.68	0.0523	0.0011	2.11	0.75	260.8	7.4	258.8	7	294	46	88.03
G-54 - 60	0	56	452	0.14	0.5650	0.0260	4.60	0.0713	0.0023	3.23	0.0575	0.0015	2.61	0.83	454	16	443.8	14	504	55	88.06
G-54 - 86	1	30	780	0.04	0.4085	0.0140	3.43	0.0545	0.0012	2.20	0.0545	0.0013	2.39	0.72	347.6	9.9	342	7.4	386	55	88.60
G-54 - 71	0	158.4	361	0.49	1.9990	0.0640	3.20	0.1804	0.0038	2.11	0.0802	0.0017	2.12	0.76	1114	22	1069.3	21	1201	43	89.03
G-54 - 93	1	5.18	681	0.01	0.2420	0.0089	3.68	0.0344	0.0008	2.27	0.0513	0.0016	3.12	0.54	219.9	7.3	217.7	4.9	244	71	89.22
G-54 - 23	0	205	302	0.76	0.6810	0.0340	4.99	0.0832	0.0020	2.40	0.0594	0.0020	3.37	0.81	527	20	514.9	12	576	75	89.39
G-54 - 42	0	71.3	262	0.28	0.3540	0.0150	4.24	0.0480	0.0016	3.33	0.0534	0.0015	2.81	0.75	307	11	302.2	9.7	338	66	89.41
G-54 - 17	0	86.5	381	0.25	1.0560	0.0370	3.50	0.1168	0.0030	2.57	0.0657	0.0014	2.13	0.80	731	18	712	18	793	46	89.79
G-54 - 80	0	94	8430	0.01	0.2533	0.0073	2.88	0.0359	0.0008	2.12	0.0513	0.0010	1.87	0.76	229.2	6	227.2	4.7	252	43	90.16
G-54 - 33	0	12.18	1200	0.01	0.2627	0.0087	3.31	0.0370	0.0008	2.13	0.0515	0.0012	2.33	0.71	236.7	7	234.4	4.9	259	55	90.50
G-54 - 26	1	13.86	428	0.03	0.2354	0.0110	4.67	0.0335	0.0009	2.57	0.0511	0.0021	4.11	0.48	214.5	8.7	212.3	5.4	234	86	90.73
G-54 - 9	1	10.79	1908	0.01	0.2428	0.0078	3.21	0.0345	0.0008	2.32	0.0511	0.0011	2.15	0.74	220.6	6.4	218.8	5	240	51	91.17
G-54 - 35	1	34	486	0.08	0.2472	0.0100	4.05	0.0351	0.0009	2.42	0.0513	0.0018	3.51	0.51	224.1	8.1	222.1	5.3	242	76	91.78
G-54 - 12	0	66.6	288	0.26	1.1400	0.0700	6.14	0.1246	0.0066	5.30	0.0665	0.0019	2.86	0.89	772	38	757	39	816	59	92.77
G-54 - 36	0	151.5	149	1.13	3.7700	0.1700	4.51	0.2685	0.0085	3.17	0.1016	0.0026	2.56	0.83	1584	39	1533	44	1651	48	92.85
G-54 - 72	0	32.2	2500	0.01	0.2612	0.0082	3.14	0.0370	0.0009	2.35	0.0513	0.0011	2.14	0.73	235.6	6.7	234.1	5.4	252	48	92.90
G-54 - 8	0	610	1275	0.52	0.5977	0.0180	3.01	0.0757	0.0017	2.25	0.0573	0.0012	2.09	0.72	475.6	11	470.4	10	503	45	93.52
G-54 - 19	1	5.25	531	0.01	0.2387	0.0100	4.19	0.0340	0.0008	2.44	0.0509	0.0017	3.34	0.60	217.2	8.2	215.6	5.2	230	73	93.74
G-54 - 83	0	544	654	0.93	0.2984	0.0110	3.69	0.0416	0.0009	2.21	0.0521	0.0016	3.07	0.55	264.9	9	262.9	5.7	280	71	93.89
G-54 - 22	1	5.56	239	0.03	0.2350	0.0330	14.04	0.0321	0.0020	6.23	0.0532	0.0041	7.71	0.66	214	25	203.4	12	320	150	95.05
G-54 - 15	0	448	566	0.87	0.7110	0.0230	3.23	0.0873	0.0020	2.29	0.0591	0.0013	2.20	0.73	544.8	14	539.6	12	567	50	95.17
G-54 - 61	1	8.83	862	0.01	0.2457	0.0084	3.42	0.0352	0.0008	2.27	0.0510	0.0014	2.75	0.60	223	6.9	223.1	5	234	62	95.34
G-54 - 68	0	39.5	131	0.34	1.6990	0.0690	4.06	0.1662	0.0049	2.95	0.0738	0.0021	2.85	0.71	1006	26	991	27	1027	58	96.49
G-54 - 53	0	332	616	0.57	0.3574	0.0140	3.92	0.0489	0.0011	2.25	0.0530	0.0017	3.21	0.57	310	10	307.5	6.5	318	70	96.70
G-54 - 39	1	11.24	665	0.02	0.2553	0.0094	3.68	0.0363	0.0008	2.23	0.0511	0.0016	3.13	0.53	230.7	7.6	229.8	5	237	68	96.96
G-54 - 34	0	55.4	715	0.09	0.2543	0.0099	3.89	0.0362	0.0009	2.46	0.0511	0.0016	3.13	0.60	229.9	8	228.9	5.5	236	69	96.99
G-54 - 10	1	Below LOD	446	0.01	0.1907	0.0090	4.72	0.0270	0.0007	2.66	0.0515	0.0022	4.27	0.44	177	7.6	172	4.5	251	90	97.18
G-54 - 56	0	117.3	322	0.41	0.8440	0.0320	3.79	0.1009	0.0023	2.28	0.0610	0.0016	2.62	0.73	620	18	619.5	14	634	57	97.71
G-54 - 54	0	140.2	377	0.43	2.2370	0.0720	3.22	0.2016	0.0049	2.43	0.0804	0.0018	2.24	0.72	1192	23	1184	27	1206	43	98.18
G-54 - 41	0	11.29	332	0.04	0.2475	0.0097	3.92	0.0354	0.0009	2.52	0.0508	0.0015	2.95	0.66	224.4	7.9	224	5.5	227	68	98.68
G-54 - 51	1	131.4	248	0.58	0.7420	0.0350	4.72	0.0916	0.0037	4.04	0.0588	0.0017	2.89	0.79	563	21	565	22	568	55	99.47
G-54 - 7	1	9.69	536	0.02	0.2494	0.0110	4.41	0.0357	0.0012	3.37	0.0509	0.0018	3.54	0.62	225.8	9	225.9	7.3	227	78	99.52
G-54 - 4	1	5.05	223.5	0.02	0.2367	0.0110	4.65	0.0341	0.0008	2.40	0.0507	0.0022	4.34	0.38	215.4	9	216.3	5.1	214	92	101.07
G-54 - 30	0	44.3	97	0.50	1.4710	0.0650	4.42	0.1531	0.0038	2.48	0.0698	0.0027	3.87	0.49	916	26	918	21	907	78	101.21
G-54 - 59	1	10.3	840	0.01	0.2590	0.0150	5.79	0.0371	0.0014	3.78	0.0508	0.0015	2.95	0.89	234.1	12	234.7	8.7	226	67	103.85
G-54 - 50	0	184.1	318	0.65	0.7740	0.0300	3.88	0.0950	0.0023	2.42	0.0591	0.0016	2.71	0.72	581	17	584.9	14	562	58	104.07
G-54 - 48	0	18.62	756	0.03	0.2446	0.0086	3.52	0.0353	0.0008	2.24	0.0503	0.0013	2.58	0.68	222.1	7	223.6	4.9	206	60	108.54
G																					

G-52d - 71	0	7.21	250	0.03	0.2700	0.0140	5.19	0.0357	0.0010	2.78	0.0549	0.0027	4.92	0.36	242	11	225.9	6.1	390	110	57.92
G-52d - 74	1	7.97	210	0.04	0.2820	0.0140	4.96	0.0372	0.0009	2.34	0.0550	0.0026	4.73	0.33	252	11	235.7	5.4	390	100	60.44
G-52d - 69	0	1.91	96.7	0.02	0.2660	0.0190	7.14	0.0352	0.0011	3.13	0.0550	0.0038	6.91	0.29	238	15	222.9	6.6	360	140	61.92
G-52d - 9	1	2.57	123.9	0.02	0.2650	0.0180	6.79	0.0356	0.0009	2.62	0.0542	0.0033	6.09	0.45	238	14	225.2	5.8	350	130	64.34
G-52d - 63	0	4.04	658	0.01	0.2660	0.0170	6.39	0.0357	0.0010	2.81	0.0543	0.0028	5.16	0.62	239	14	225.8	6.3	350	110	64.51
G-52d - 54	0	19.9	310	0.07	0.2560	0.0130	5.08	0.0347	0.0009	2.65	0.0537	0.0025	4.66	0.41	230.9	10	220.1	5.8	337	100	65.31
G-52d - 26	0	1.85	217.2	0.01	0.2599	0.0100	3.85	0.0356	0.0008	2.27	0.0536	0.0017	3.17	0.57	234.5	8.9	225.8	5	342	72	66.02
G-52d - 44	1	6.43	179	0.04	0.2550	0.0410	16.08	0.0345	0.0012	3.48	0.0537	0.0067	12.48	1.03	230	29	218.7	7.3	330	180	66.27
G-52d - 33	1	2.82	140	0.02	0.2490	0.0150	6.02	0.0337	0.0009	2.79	0.0536	0.0028	5.22	0.50	225	12	213.8	5.9	320	110	66.81
G-52d - 6	0	204	444	0.53	0.5110	0.0290	5.68	0.0626	0.0029	4.63	0.0593	0.0016	2.70	0.88	419	19	391.4	17	576	62	67.95
G-52d - 17	1	0.18	123.6	0.00	0.2600	0.0240	9.23	0.0353	0.0010	2.83	0.0536	0.0043	8.02	0.55	234	19	223.8	6.4	310	170	72.19
G-52d - 13	1	12.73	307	0.05	0.2690	0.0120	4.46	0.0369	0.0009	2.55	0.0531	0.0020	3.77	0.54	241.8	9.7	233.3	5.8	318	81	73.36
G-52d - 11	0	2.92	207	0.01	0.2790	0.0170	6.09	0.0380	0.0010	2.58	0.0535	0.0030	5.61	0.39	250	13	240.6	6.1	320	120	75.19
G-52d - 21	0	5.01	173	0.03	0.2700	0.0150	5.56	0.0370	0.0010	2.59	0.0532	0.0028	5.26	0.34	242	12	234.3	6	310	110	75.58
G-52d - 73	1	3.79	293	0.01	0.2670	0.0140	5.24	0.0369	0.0011	2.98	0.0528	0.0024	4.55	0.50	240.2	11	233.3	6.6	306	97	76.24
G-52d - 15	1	7.57	324	0.03	0.2560	0.0130	5.08	0.0355	0.0009	2.53	0.0524	0.0023	4.39	0.50	231.3	11	225	5.6	294	95	76.53
G-52d - 29	0	6.16	178	0.04	0.2650	0.0150	5.66	0.0366	0.0009	2.57	0.0527	0.0029	5.50	0.29	238	12	231.5	5.9	300	120	77.17
G-52d - 53	1	12.92	285	0.05	0.2590	0.0130	5.02	0.0360	0.0010	2.70	0.0524	0.0022	4.20	0.55	233.4	10	227.7	6	292	93	77.98
G-52d - 55	0	7.79	219	0.04	0.2580	0.0170	6.59	0.0358	0.0009	2.54	0.0530	0.0032	6.04	0.40	232	14	226.6	5.6	290	120	78.14
G-52d - 49	1	8	364	0.02	0.2590	0.0140	5.41	0.0358	0.0009	2.54	0.0523	0.0024	4.59	0.53	233.5	11	226.7	5.7	287	95	78.99
G-52d - 50	0	7.6	278	0.02	0.2660	0.0130	4.89	0.0368	0.0010	2.72	0.0526	0.0024	4.56	0.39	239	11	232.7	6.5	290	98	80.24
G-52d - 67	0	Below LOD	284	0.04	0.2680	0.0140	5.22	0.0373	0.0010	2.58	0.0522	0.0022	4.21	0.60	241	12	235.8	6	282	89	83.62
G-52d - 30	1	0.31	115.9	0.00	0.2650	0.0250	9.43	0.0322	0.0010	3.01	0.0598	0.0050	8.36	0.50	238	19	204.5	6	560	160	85.92
G-52d - 36	1	7.59	390	0.02	0.2543	0.0110	4.33	0.0358	0.0009	2.40	0.0516	0.0017	3.29	0.66	229.9	8.7	227	5.4	261	73	86.97
G-52d - 72	1	9.66	304	0.04	0.2550	0.0140	5.49	0.0360	0.0009	2.56	0.0518	0.0023	4.44	0.60	230.3	11	227.9	5.7	261	94	87.32
G-52d - 2	1	9.02	231.9	0.04	0.2640	0.0140	5.30	0.0369	0.0010	2.58	0.0520	0.0023	4.42	0.56	237.3	11	233.5	5.9	267	95	87.45
G-52d - 42	1	14.07	291	0.05	0.2530	0.0130	5.14	0.0355	0.0008	2.34	0.0516	0.0022	4.26	0.57	228.2	11	225	5.1	257	93	87.55
G-52d - 34	1	14.38	260	0.06	0.2620	0.0140	5.34	0.0369	0.0009	2.49	0.0517	0.0025	4.84	0.43	238.4	10	233.5	5.7	262	110	89.12
G-52d - 25	1	5.57	606	0.01	0.2490	0.0110	4.42	0.0351	0.0009	2.51	0.0515	0.0019	3.69	0.55	225.2	9	222.5	5.5	248	80	89.72
G-52d - 43	0	23.29	373	0.07	0.2514	0.0100	3.98	0.0356	0.0009	2.50	0.0515	0.0020	3.88	0.35	227.5	8.3	225.4	5.5	251	82	89.80
G-52d - 57	1	19.5	306	0.01	0.2588	0.0110	4.25	0.0365	0.0008	2.28	0.0516	0.0020	3.88	0.43	233.4	9.1	230.8	5.2	256	84	90.16
G-52d - 64	0	15.35	313	0.06	0.2580	0.0130	5.04	0.0368	0.0009	2.56	0.0511	0.0023	4.50	0.45	234.9	11	232.8	5.8	256	100	90.94
G-52d - 46	1	5.43	367	0.02	0.2516	0.0120	4.77	0.0356	0.0009	2.64	0.0515	0.0022	4.27	0.46	227.6	9.3	225.6	5.8	247	90	91.34
G-52d - 23	0	13.28	300	0.05	0.2530	0.0130	5.14	0.0357	0.0009	2.44	0.0514	0.0021	4.09	0.62	228.9	10	226.1	5.4	245	89	92.29
G-52d - 70	1	7.96	252.8	0.03	0.2490	0.0130	5.22	0.0353	0.0009	2.61	0.0514	0.0026	5.06	0.31	225.5	11	223.6	5.7	240	110	93.17
G-52d - 8	0	7.01	560	0.01	0.2501	0.0100	4.00	0.0355	0.0008	2.22	0.0512	0.0018	3.52	0.48	226.5	8.3	225.1	4.9	240	78	93.79
G-52d - 7	1	7.74	521	0.02	0.1960	0.0089	4.54	0.0269	0.0007	2.64	0.0530	0.0022	4.15	0.43	181.2	7.6	170.8	4.5	310	90	94.26
G-52d - 75	0	12.09	229	0.06	0.2550	0.0120	4.71	0.0362	0.0010	2.71	0.0513	0.0024	4.68	0.30	229.9	9.9	228.9	6.1	242	98	94.59
G-52d - 5	0	3.93	602	0.01	0.2634	0.0095	3.61	0.0373	0.0008	2.20	0.0513	0.0016	3.12	0.51	237.3	7.7	236.1	5.1	247	68	95.59
G-52d - 51	1	10	338	0.03	0.2490	0.0130	5.22	0.0355	0.0009	2.59	0.0511	0.0022	4.31	0.57	225.7	10	225.1	5.8	230	92	97.87
G-52d - 39	1	9.6	261	0.04	0.2510	0.0120	4.78	0.0362	0.0009	2.46	0.0506	0.0022	4.35	0.43	227.3	10	229.3	5.5	232	100	98.84
G-52d - 38	0	12.43	287	0.05	0.2570	0.0130	5.06	0.0366	0.0009	2.51	0.0511	0.0023	4.50	0.46	231.7	11	231.9	5.7	230	98	100.83
G-52d - 1	0	21	389	0.06	0.2584	0.0110	4.26	0.0368	0.0009	2.50	0.0510	0.0018	3.53	0.56	233.1	8.8	233.2	5.7	230	77	101.39
G-52d - 14	0	5.58	167.2	0.01	0.2580	0.0140	5.43	0.0369	0.0011	2.98	0.0510	0.0025	4.90	0.44	233	12	233.4	6.5	230	110	101.48
G-52d - 37	0	8.48	363	0.03	0.2510	0.0110	4.38	0.0359	0.0009	2.48	0.0509	0.0020	3.93	0.46	227.1	8.5	227.6	5.5	224	87	101.61
G-52d - 3	0	17.85	299	0.07	0.2530	0.0130	5.14	0.0361	0.0009	2.41	0.0509	0.0024	4.72	0.40	228.6	11	228.8	5.4	225	96	101.69
G-52d - 45	0	6.45	169	0.04	0.2620	0.0150	5.73	0.0370	0.0009	2.54	0.0512	0.0029	5.66	0.25	236	12	234.3	5.9	230	120	101.87
G-52d - 59	0	48.4	385	0.14	0.2628	0.0120	4.57	0.0374	0.0009	2.43	0.0510	0.0019	3.73	0.58	236.6	9.6	237	5.7	232	82	102.16
G-52d - 48	0	11.5	261	0.04	0.2550	0.0140	5.49	0.0365	0.0010	2.74	0.0509	0.0023	4.52	0.57	230.5	11	230.9	6.4	226	95	102.17
G-52d - 28	0	7	197	0.04	0.2620	0.0170	6.49	0.0372	0.0010	2.61	0.0505	0.0028	5.54	0.54	236	14	235.5	6	230	120	102.39
G-52d - 4	1	12.68	320	0.04	0.2610	0.0110	4.21	0.0373	0.0009	2.36	0.0510	0.0020	3.92	0.40	235.2	9	235.9	5.5	229	85	103.01
G-52d - 41	1	13.87	305.7	0.05	0.2550	0.0130	5.10	0.0365	0.0009	2.44	0.0508	0.0024	4.72	0.39	230.2	11	231.1	5.5	222	99	104.10
G-52d - 20	1	9.71	295	0.04	0.2490	0.0130	5.22	0.0357	0.0008	2.32	0.0506	0.0023	4.55	0.49	225	10	226.3	5.2	210	95	107.76
G-52d - 10	0	25.3	497	0.06	0.2522	0.0100	3.97	0.0363	0.0008	2.31	0.0505	0.0016	3.17	0.60	228.1	8.2	229.8	5.2	213	71	107.89
G-52d - 62	0	4.62	234	0.02	0.2520	0.0170	6.75	0.0360	0.0010	2.64	0.0507	0.0029	5.72	0.55	228	14	228.1	5.9	210	110	108.62
G-52d - 35	0	5.92	510	0.07	0.2526	0.0110	4.35	0.0365	0.0009	2.39	0.0504	0.0020	3.97	0.43	228.4	9.3	230.8	5.4	206	83	112.04
G-52d - 12	0	12.54	327	0.04	0.2530	0.0120	4.74	0.0367	0.0010	2.64	0.0500	0.0023	4.60	0.33	228.3	9.9	232.5	6.1	207	94	112.32
G-52d - 24	0	4.12	605	0.01	0.2571	0.0110	4.28	0.0371	0.0009	2.35	0.0504	0.0019	3.77	0.48	232	9	234.7	5.4	208	79	112.84
G-52d - 31	0	5.84	132.7	0.05	0.2510	0.0200	7.97	0.0361</													

M2_GC061_50	0	56	87	0.64	0.7740	0.0290	3.75	0.0772	0.0025	3.24	0.0698	0.0010	1.43	0.93	581	14	479	14	916	29	52.29
M2_GC061_25	1	19	19	1.00	0.7980	0.0520	6.52	0.0791	0.0039	4.93	0.0705	0.0020	2.84	0.91	594	22	491	22	902	60	54.43
M3_GC061_6	1	24	27	0.89	0.7550	0.0500	6.62	0.0769	0.0036	4.68	0.0682	0.0019	2.79	0.94	568	21	478	20	865	55	55.26
M2_GC061_26	0	22	18	1.22	0.8240	0.0600	7.28	0.0810	0.0041	5.06	0.0709	0.0022	3.10	0.94	606	25	502	23	899	67	55.84
M2_GC061_13	0	11	35	0.31	1.3400	0.1400	10.45	0.1139	0.0078	6.85	0.0825	0.0022	2.67	0.90	861	42	695	42	1243	48	55.91
M2_GC061_59	1	19	17	1.12	0.8090	0.0540	6.67	0.0816	0.0037	4.53	0.0696	0.0021	3.02	0.93	602	23	505	21	887	64	56.93
M2_GC061_28	0	18	16	1.13	1.1810	0.0780	6.60	0.1053	0.0055	5.22	0.0782	0.0022	2.81	0.91	787	26	645	30	1128	55	57.18
M2_GC061_22	1	22	22	1.00	0.7870	0.0480	6.10	0.0803	0.0037	4.61	0.0684	0.0017	2.49	0.93	586	20	498	21	858	51	58.04
M2_GC061_60	0	25	27	0.93	0.9390	0.0660	7.03	0.0911	0.0046	5.05	0.0719	0.0016	2.23	0.99	668	27	562	26	968	40	58.06
M2_GC061_30	1	24	23	1.04	0.7930	0.0510	6.43	0.0808	0.0038	4.70	0.0689	0.0019	2.76	0.92	590	22	501	22	860	56	58.26
M2_GC061_3	1	22	23	0.96	0.8240	0.0460	5.58	0.0837	0.0036	4.30	0.0695	0.0017	2.45	0.91	610	20	518	20	888	51	58.33
M2_GC061_27	0	15	14	1.07	0.9340	0.0640	6.85	0.0900	0.0043	4.78	0.0722	0.0022	3.05	0.92	664	26	555	24	951	66	58.36
M2_GC061_40	0	24	22	1.09	0.8860	0.0530	5.98	0.0878	0.0039	4.44	0.0704	0.0016	2.27	0.95	641	21	542	22	922	47	58.79
M2_GC061_49	1	23	22	1.05	0.7660	0.0520	6.79	0.0788	0.0037	4.70	0.0678	0.0018	2.65	0.96	574	23	489	21	831	57	58.84
M2_GC061_35	1	24	24	1.00	0.7760	0.0490	6.31	0.0802	0.0037	4.61	0.0683	0.0018	2.64	0.93	581	21	497	21	844	55	58.89
M2_GC061_38	1	18	17	1.06	0.8010	0.0510	6.37	0.0817	0.0037	4.53	0.0689	0.0020	2.90	0.91	596	23	506	21	850	62	59.53
M3_GC061_7	0	24	26	0.92	0.7980	0.0490	6.14	0.0815	0.0039	4.79	0.0680	0.0017	2.50	0.92	593	21	505	22	847	51	59.62
M2_GC061_39	0	16	15	1.07	0.9150	0.0550	6.01	0.0897	0.0041	4.57	0.0712	0.0019	2.67	0.91	655	23	554	23	928	58	59.70
M2_GC061_23	0	22	27	0.81	0.8040	0.0550	6.84	0.0821	0.0041	4.99	0.0682	0.0018	2.64	0.95	596	23	509	23	849	55	59.95
M2_GC061_32	1	22	21	1.05	0.7770	0.0520	6.69	0.0803	0.0037	4.61	0.0680	0.0020	2.94	0.93	583	22	498	21	823	60	60.51
M2_GC061_21	0	2	4	0.50	1.0100	0.1500	14.85	0.0962	0.0092	9.56	0.0753	0.0044	5.84	0.98	709	51	591	48	970	120	60.93
M2_GC061_2	0	5	11	0.45	1.2500	0.2000	16.00	0.1130	0.0120	10.62	0.0775	0.0026	3.35	0.90	816	52	688	61	1116	61	61.65
M2_GC061_42	1	17	16	1.06	0.7740	0.0550	7.11	0.0799	0.0037	4.63	0.0674	0.0020	2.97	0.96	578	24	496	21	801	66	61.92
M2_GC061_9	1	22	22	1.00	0.7790	0.0480	6.16	0.0811	0.0037	4.56	0.0670	0.0018	2.69	0.92	582	21	502	21	810	54	61.98
M2_GC061_19	0	21	19	1.11	0.9160	0.0540	5.90	0.0917	0.0039	4.25	0.0703	0.0018	2.56	0.92	659	21	566	22	911	53	62.13
M2_GC061_31	0	7	8	0.88	0.7930	0.0760	9.58	0.0807	0.0043	5.33	0.0692	0.0033	4.77	0.95	587	32	500	24	803	97	62.27
M2_GC061_8	0	13	23	0.57	0.9500	0.0640	6.74	0.0934	0.0044	4.71	0.0711	0.0021	2.95	0.93	674	26	575	24	921	62	62.43
M2_GC061_14	1	18	18	1.00	0.8050	0.0490	6.09	0.0835	0.0037	4.43	0.0673	0.0018	2.67	0.92	599	21	517	21	820	55	63.05
M2_GC061_24	0	7	10	0.70	0.7820	0.0680	8.70	0.0808	0.0042	5.20	0.0683	0.0029	4.25	0.94	583	29	501	24	791	92	63.34
M2_GC061_58	0	10	19	0.53	1.3130	0.0750	5.71	0.1179	0.0055	4.66	0.0783	0.0017	2.17	0.93	847	24	718	29	1130	44	63.54
M2_GC061_18	0	19	19	1.00	0.9100	0.0540	5.93	0.0928	0.0038	4.09	0.0691	0.0019	2.75	0.91	653	23	572	21	871	56	65.67
M2_GC061_34	0	22	20	1.10	0.9320	0.0560	6.01	0.0949	0.0040	4.21	0.0700	0.0019	2.71	0.92	667	24	584	22	887	60	65.84
M2_GC061_47	0	12	19	0.63	0.9000	0.0530	5.89	0.0922	0.0039	4.23	0.0690	0.0019	2.75	0.90	648	23	568	22	862	57	65.89
M2_GC061_48	0	11	11	1.00	0.8690	0.0620	7.13	0.0895	0.0040	4.47	0.0686	0.0023	3.35	0.94	632	27	552	22	827	74	66.75
M2_GC061_55	0	10	19	0.53	1.3350	0.0740	5.54	0.1213	0.0049	4.04	0.0775	0.0020	2.58	0.90	857	25	738	27	1103	51	66.91
M2_GC061_20	0	6	9	0.67	0.9020	0.0850	9.42	0.0895	0.0058	6.48	0.0689	0.0030	4.35	0.92	645	35	556	32	825	94	67.39
M3_GC061_4	1	19	18	1.06	0.9520	0.0540	5.67	0.0976	0.0039	4.00	0.0687	0.0018	2.62	0.91	677	22	600	22	861	55	69.69
M2_GC061_12	1	22	21	1.05	0.8890	0.0520	5.85	0.0927	0.0038	4.10	0.0677	0.0018	2.66	0.92	642	22	571	21	817	58	69.89
M2_GC061_15	0	14	13	1.08	0.9670	0.0670	6.93	0.0983	0.0047	4.78	0.0693	0.0022	3.17	0.92	685	27	604	27	857	69	70.48
M2_GC061_37	0	7	10	0.70	0.7770	0.0730	9.40	0.0833	0.0044	5.28	0.0654	0.0028	4.28	0.99	577	30	518	25	727	89	71.25
M3_GC061_3	0	16	15	1.07	0.9740	0.0560	5.75	0.0994	0.0038	3.82	0.0692	0.0022	3.18	0.85	685	24	611	21	844	68	72.39
M3_GC061_5	0	6	9	0.67	1.0420	0.0840	8.06	0.1032	0.0049	4.75	0.0703	0.0027	3.84	0.95	717	31	633	27	870	82	72.76
M2_GC061_7	0	21	20	1.05	0.9400	0.0510	5.43	0.0975	0.0039	4.00	0.0678	0.0018	2.65	0.88	669	22	600	22	824	58	72.82
M2_GC061_44	1	26	27	0.96	0.9320	0.0480	5.15	0.0990	0.0035	3.54	0.0672	0.0019	2.83	0.85	666	21	609	20	821	59	74.18
M2_GC061_6	0	25	24	1.04	1.0420	0.0520	4.99	0.1071	0.0038	3.55	0.0694	0.0018	2.59	0.87	721	22	656	21	876	56	74.89
M3_GC061_9	1	19	18	1.06	1.0730	0.0560	5.22	0.1095	0.0039	3.56	0.0697	0.0021	3.01	0.83	738	23	669	22	887	62	75.42
M2_GC061_36	0	1	4	0.25	0.8000	0.1100	13.75	0.0851	0.0056	6.58	0.0679	0.0049	7.22	0.90	591	47	526	32	690	150	76.23
M2_GC061_65	1	23	22	1.05	1.0490	0.0500	4.77	0.1097	0.0039	3.56	0.0682	0.0017	2.49	0.86	727	21	671	22	856	52	78.39
M3_GC061_2	1	20	18	1.11	1.1230	0.0560	4.99	0.1151	0.0040	3.48	0.0695	0.0019	2.73	0.85	760	23	702	23	887	59	79.14
M2_GC061_17	0	23	19	1.21	1.2500	0.0610	4.88	0.1246	0.0047	3.77	0.0719	0.0018	2.50	0.86	818	24	757	26	954	50	79.35
M2_GC061_46	1	20	18	1.11	1.0040	0.0520	5.18	0.1058	0.0037	3.50	0.0677	0.0021	3.10	0.81	701	22	648	21	808	65	80.20
M2_GC061_57	1	22	20	1.10	1.0000	0.0510	5.10	0.1057	0.0038	3.60	0.0676	0.0020	2.96	0.82	699	22	648	21	807	62	80.30
M2_GC061_54	1	22	21	1.05	0.9980	0.0510	5.11	0.1067	0.0037	3.47	0.0671	0.0019	2.83	0.85	701	22	654	21	806	58	81.14
M2_GC061_61	1	20	19	1.05	0.9830	0.0510	5.19	0.1052	0.0037	3.52	0.0665	0.0019	2.86	0.85	691	22	644	21	787	64	81.83
M2_GC061_1	0	16	20	0.80	1.0490	0.0560	5.34	0.1104	0.0040	3.62	0.0676	0.0020	2.96	0.85	726	24	675	22	822	63	82.12
M2_GC061_62	0	0	4	0.00	2.4200	0.6100	25.21	0.1970	0.0380	19.29	0.0867	0.0041	4.73	0.80	1223	88	1150	170	1245	91	92.37
M2_GC061_45	0	51	41	1.24	1.4130	0.0450	3.18	0.1481	0.0036	2.43	0.0696	0.0014	2.01	0.78	892	19	890	20	897	41	99.22
M3_GC061_13	0	52	45	1.16	1.5990	0.0490	3.06	0.1610	0.0039	2.42	0.0718	0.0013	1.81	0.81	967	19	962	22	969	36	99.28
M2_GC061_53	0	27	25	1.08	1.3750	0.0610	4.44	0.1441	0.0046	3.19	0.0693	0.0017	2.45	0.84	874	24	867	26	873	51	99.31
M3_GC061_11	0	60	71	0.85	1.6050	0.0450	2.80	0.1625	0.0039	2.40	0.0716	0.0010	1.37	0.87	971	17	970	22	969	29	100.10
M2_GC061_4	0	21	52	0.40	1.8060	0.0610	3.38	0.1759	0.0049	2.79	0.0743	0.0014	1.88	0.83	1045</						

M2_GC061_11	0	3	14	0.21	3.1700	0.1800	5.68	0.2650	0.0120	4.53	0.0851	0.0016	1.88	0.96	1445	39	1515	60	1301	37	116.45
M2_GC061_51	0	1	1	1.00	1.0300	0.3200	31.07	0.1000	0.0200	20.00	0.0676	0.0082	12.13	0.98	630	99	610	100	510	230	119.61
M2_GC061_16	0	10	9	1.11	1.3120	0.0920	7.01	0.1458	0.0049	3.36	0.0647	0.0038	5.87	0.55	826	38	877	27	660	120	132.88
M1_GC021_12	1	43	32	1.34	0.2130	0.0150	7.04	0.0286	0.0010	3.50	0.0534	0.0026	4.87	0.77	195	12	181.6	6.3	288	97	93.13
M1_GC021_9	1	74	47	1.57	0.3200	0.0160	5.00	0.0431	0.0011	2.55	0.0547	0.0025	4.57	0.42	280	13	271.8	6.9	345	90	97.07
M1_GC021_1	0	60	42	1.43	0.3140	0.0140	4.46	0.0434	0.0011	2.53	0.0525	0.0020	3.81	0.52	275	11	273.9	6.9	280	77	97.82
M1_GC021_2	1	82	57	1.44	0.3110	0.0140	4.50	0.0427	0.0011	2.58	0.0530	0.0021	3.96	0.48	274	11	269.8	6.5	304	81	98.47
M1_GC021_10	1	26	29	0.90	0.2180	0.0170	7.80	0.0311	0.0012	3.86	0.0503	0.0026	5.17	0.81	199	13	197.3	7.1	180	100	99.15
M1_GC021_4	1	47	56	0.84	0.2980	0.0130	4.36	0.0423	0.0010	2.36	0.0513	0.0020	3.90	0.46	263	11	267.1	6.4	232	78	101.56
M1_GC021_5	1	34	35	0.97	0.3050	0.0180	5.90	0.0432	0.0011	2.55	0.0516	0.0028	5.43	0.39	268	14	272.4	6.8	230	100	101.64
M1_GC021_8	1	17	19	0.89	0.2140	0.0180	8.41	0.0313	0.0012	3.83	0.0490	0.0029	5.92	0.78	195	15	198.8	7.1	130	110	101.95
M1_GC021_11	1	29	36	0.81	0.3000	0.0140	4.67	0.0429	0.0011	2.56	0.0510	0.0021	4.12	0.48	264	11	270.9	6.9	224	85	102.61
M1_GC021_7	1	24	30	0.80	0.3040	0.0170	5.59	0.0435	0.0012	2.76	0.0506	0.0025	4.94	0.47	267	13	274.4	7.1	201	95	102.77
M1_GC021_3	0	68	44	1.55	0.3010	0.0150	4.98	0.0437	0.0011	2.52	0.0502	0.0022	4.38	0.48	265	11	275.7	6.7	185	83	104.04
M1_GC021_6	0	63	38	1.66	0.2980	0.0170	5.70	0.0434	0.0011	2.53	0.0499	0.0025	5.01	0.48	262	13	273.6	6.9	179	97	104.43
M1_GC021_13	1	47	39	1.21	0.2820	0.0160	5.67	0.0434	0.0011	2.53	0.0475	0.0025	5.26	0.38	250	13	273.6	6.9	78	97	109.44
B__235_11	0	35.1	134	0.26	2.5400	0.1700	6.69	0.1903	0.0049	2.57	0.0968	0.0056	5.79	0.88	1276	47	1122	26	1540	100	72.86
B__235_79	0	562	2337	0.24	1.2960	0.0380	2.93	0.1294	0.0033	2.55	0.0735	0.0014	1.91	0.79	843	17	784	19	1030	37	76.12
B__235_30	1	9.01	82.9	0.11	2.1010	0.0990	4.71	0.1797	0.0034	1.89	0.0844	0.0037	4.38	0.73	1146	31	1065	19	1287	79	82.75
B__235_75	1	10.65	94.1	0.11	1.9320	0.0840	4.35	0.1721	0.0033	1.92	0.0817	0.0032	3.92	0.92	1090	28	1023.7	18	1228	73	83.36
B__235_21	1	94.4	1239	0.08	1.8490	0.0550	2.97	0.1692	0.0043	2.54	0.0789	0.0015	1.90	0.87	1062	20	1008	24	1168	37	86.30
B__235_61	0	763	3580	0.21	1.8850	0.0660	3.50	0.1749	0.0044	2.52	0.0783	0.0014	1.79	0.81	1078	24	1039	24	1157	33	89.80
B__235_22	0	37.6	206.8	0.18	1.9680	0.0680	3.46	0.1823	0.0061	3.35	0.0786	0.0014	1.78	0.86	1107	24	1079	34	1162	35	92.86
B__235_16	1	8.04	58.6	0.14	1.9990	0.0780	3.90	0.1819	0.0042	2.31	0.0785	0.0019	2.42	0.77	1114	26	1077	23	1155	49	93.25
B__235_74	0	51	223	0.23	2.4280	0.0640	2.64	0.2081	0.0060	2.88	0.0847	0.0019	2.24	0.78	1254	21	1218	32	1305	42	93.33
B__235_34	1	109.6	381	0.29	2.4920	0.0700	2.81	0.2109	0.0055	2.61	0.0853	0.0019	2.23	0.65	1269	20	1233	29	1320	42	93.41
B__235_90	0	62.6	307	0.20	2.0510	0.0570	2.78	0.1877	0.0042	2.24	0.0791	0.0014	1.77	0.86	1132	19	1109	23	1179	32	94.06
B__235_32	1	12.46	100.9	0.12	1.7670	0.0530	3.00	0.1698	0.0040	2.36	0.0752	0.0017	2.26	0.66	1033	21	1011	22	1072	47	94.31
B__235_69	1	25.45	454	0.06	2.0410	0.0660	3.23	0.1887	0.0050	2.65	0.0794	0.0015	1.89	0.85	1128	22	1114	27	1181	38	94.33
B__235_4	0	32.4	128.8	0.25	2.2010	0.0640	2.91	0.1958	0.0050	2.55	0.0810	0.0016	1.98	0.79	1181	20	1152	27	1220	38	94.43
B__235_86	1	83	350	0.24	2.3650	0.0690	2.92	0.2065	0.0049	2.37	0.0836	0.0015	1.79	0.84	1231	21	1210	26	1281	35	94.46
B__235_43	0	241.3	462	0.52	2.3850	0.0700	2.94	0.2080	0.0053	2.55	0.0837	0.0016	1.91	0.81	1237	21	1218	28	1284	37	94.86
B__235_1	0	90.9	325	0.28	1.7290	0.0490	2.83	0.1689	0.0039	2.31	0.0747	0.0014	1.87	0.81	1019	18	1006	21	1060	37	94.91
B__235_7	0	10.32	98.2	0.11	1.7430	0.0520	2.98	0.1681	0.0040	2.38	0.0746	0.0017	2.28	0.64	1024	19	1002	22	1055	45	94.98
B__235_56	1	117.1	436	0.27	2.4350	0.0770	3.16	0.2123	0.0059	2.78	0.0846	0.0017	2.01	0.81	1252	23	1241	31	1304	38	95.17
B__235_77	0	55.5	218.5	0.25	2.2700	0.0660	2.91	0.2017	0.0045	2.23	0.0817	0.0018	2.20	0.64	1202	21	1184	24	1242	44	95.33
B__235_84	1	45.5	187	0.24	1.7870	0.0560	3.13	0.1725	0.0047	2.72	0.0755	0.0014	1.86	0.85	1040	20	1030	26	1080	37	95.37
B__235_35	1	26.7	90.1	0.30	2.1800	0.1100	5.05	0.1940	0.0053	2.73	0.0802	0.0025	3.12	0.91	1172	35	1143	29	1195	61	95.65
B__235_88	0	81.8	380	0.22	2.3090	0.0730	3.16	0.2040	0.0056	2.75	0.0820	0.0016	1.95	0.85	1214	22	1197	30	1249	36	95.84
B__235_15	1	14.24	113.3	0.13	1.6960	0.0520	3.07	0.1659	0.0035	2.11	0.0738	0.0019	2.57	0.35	1006	19	989	20	1031	49	95.93
B__235_52	1	148.8	600	0.25	2.3990	0.0660	2.75	0.2097	0.0048	2.29	0.0834	0.0015	1.80	0.78	1242	20	1227	26	1278	36	96.01
B__235_26	0	69.1	354	0.20	2.1750	0.0710	3.26	0.1973	0.0057	2.89	0.0804	0.0016	1.99	0.85	1172	23	1161	31	1209	37	96.03
B__235_6	0	9.27	84.6	0.11	1.6720	0.0430	2.57	0.1649	0.0033	2.00	0.0735	0.0016	2.18	0.49	997.8	16	984	18	1024	44	96.09
B__235_55	0	225	605	0.37	1.9420	0.0560	2.88	0.1832	0.0047	2.57	0.0771	0.0016	2.08	0.73	1095	20	1084	25	1128	39	96.10
B__235_38	1	20.93	152.6	0.14	1.6640	0.0440	2.64	0.1642	0.0029	1.77	0.0733	0.0015	2.05	0.35	994.6	16	980.2	16	1019	39	96.19
B__235_60	1	193.1	531	0.36	2.4320	0.0660	2.71	0.2128	0.0048	2.26	0.0836	0.0018	2.15	0.55	1252	20	1244	26	1293	41	96.21
B__235_53	0	150.7	429	0.35	2.4030	0.0640	2.66	0.2098	0.0057	2.72	0.0834	0.0017	2.04	0.82	1243	19	1228	30	1276	40	96.24
B__235_19	1	43.4	203.1	0.21	2.6690	0.0760	2.85	0.2237	0.0050	2.24	0.0866	0.0019	2.19	0.60	1322	20	1301	26	1349	42	96.44
B__235_59	1	128.4	1029	0.12	2.2100	0.0620	2.81	0.1996	0.0049	2.45	0.0808	0.0015	1.86	0.82	1184	20	1173	27	1216	37	96.46
B__235_28	0	34	245.2	0.14	2.2420	0.0830	3.70	0.1963	0.0059	3.01	0.0803	0.0015	1.87	0.92	1193	26	1161	32	1203	38	96.51
B__235_71	0	77.3	265.9	0.29	1.7370	0.0500	2.88	0.1710	0.0049	2.87	0.0742	0.0014	1.89	0.74	1022	19	1018	27	1051	41	96.86
B__235_78	1	79.5	297	0.27	2.5800	0.0690	2.67	0.2192	0.0053	2.42	0.0848	0.0017	2.00	0.60	1294	20	1278	28	1316	35	97.11
B__235_37	0	32.6	90.9	0.36	2.2290	0.0690	3.10	0.2003	0.0046	2.30	0.0804	0.0018	2.24	0.70	1189	22	1177	25	1211	42	97.19
B__235_29	1	55.8	276.6	0.20	2.6310	0.0730	2.77	0.2219	0.0056	2.52	0.0856	0.0016	1.87	0.75	1309	20	1292	29	1326	37	97.44
B__235_80	1	59.1	280	0.21	1.6790	0.0580	3.45	0.1676	0.0046	2.74	0.0730	0.0015	2.05	0.81	1003	23	999	25	1025	41	97.46
B__235_44	0	121	1011	0.12	2.1310	0.0730	3.43	0.1960	0.0060	3.06	0.0795	0.0014	1.76	0.85	1158	24	1153	32	1183	36	97.46
B__235_20	1	71.4	328	0.22	2.4400	0.0670	2.75	0.2121	0.0058	2.73	0.0832	0.0018	2.16	0.77	1257	22	1240	31	1272	41	97.48
B__235_72	1	75.7	232	0.33	2.0560	0.0640	3.11	0.1929	0.0053	2.75	0.0788	0.0015	1.90	0.78	1137	21	1137	29	1165	39	97.60
B__235_50	0	59	171.5	0.34	2.5710	0.0810	3.15	0.2204	0.0050	2.27	0.0850	0.0019	2.24	0.82	1292	23	1284	27	1313	43	97.79
B__235_63	0	23.5	124.3	0.19																	

B_235_40	0	76	290	0.26	2.4540	0.0830	3.38	0.2139	0.0054	2.52	0.0828	0.0020	2.42	0.72	1257	24	1249	29	1260	48	99.13
B_235_17	1	17.2	116.5	0.15	1.7630	0.0590	3.35	0.1728	0.0043	2.49	0.0740	0.0019	2.57	0.77	1031	21	1027	23	1036	50	99.13
B_235_76	0	40.8	176.9	0.23	2.4910	0.0670	2.69	0.2173	0.0042	1.93	0.0833	0.0016	1.92	0.68	1269	19	1267	22	1275	38	99.37
B_235_49	0	22.89	170.6	0.13	1.6270	0.0450	2.77	0.1639	0.0034	2.07	0.0719	0.0015	2.09	0.62	980	18	978	19	980	44	99.80
B_235_5	1	22.19	101.4	0.22	2.3720	0.0640	2.70	0.2095	0.0042	2.00	0.0813	0.0015	1.85	0.79	1234	19	1226	23	1228	36	99.84
B_235_9	0	148	482	0.31	2.5000	0.0790	3.16	0.2165	0.0055	2.54	0.0826	0.0021	2.54	0.64	1271	23	1263	29	1264	51	99.92
B_235_25	1	5.15	83.4	0.06	1.6870	0.0480	2.85	0.1683	0.0036	2.14	0.0727	0.0016	2.20	0.55	1003	18	1003	20	1003	45	100.00
B_235_82	0	8.4	112.4	0.07	1.7190	0.0490	2.85	0.1713	0.0038	2.22	0.0730	0.0017	2.33	0.55	1018	19	1019	21	1019	44	100.00
B_235_58	1	16.93	140.8	0.12	1.8030	0.0520	2.88	0.1772	0.0037	2.09	0.0745	0.0018	2.42	0.55	1046	18	1051	21	1051	48	100.00
B_235_70	0	90.9	370.1	0.25	2.5260	0.0770	3.05	0.2191	0.0055	2.51	0.0834	0.0015	1.80	0.79	1279	22	1277	29	1277	35	100.00
B_235_62	0	159	530	0.30	2.3890	0.0690	2.89	0.2130	0.0057	2.68	0.0817	0.0017	2.08	0.79	1242	22	1245	30	1237	40	100.65
B_235_45	1	34.6	184.2	0.19	1.7070	0.0530	3.10	0.1696	0.0036	2.12	0.0727	0.0018	2.48	0.91	1011	20	1010	20	1003	49	100.70
B_235_68	0	87.3	277.6	0.31	2.4470	0.0690	2.82	0.2174	0.0053	2.44	0.0824	0.0016	1.94	0.75	1256	21	1268	28	1258	38	100.79
B_235_65	0	62	154.5	0.40	2.6810	0.0690	2.57	0.2290	0.0046	2.01	0.0852	0.0017	2.00	0.32	1323	19	1329	24	1318	38	100.83
B_235_2	0	20.1	184.1	0.11	1.7040	0.0420	2.46	0.1692	0.0033	1.95	0.0725	0.0013	1.79	0.69	1009.9	16	1007	18	998	37	100.90
B_235_46	1	19.5	156.3	0.12	1.7220	0.0480	2.79	0.1702	0.0039	2.29	0.0727	0.0017	2.34	0.54	1016	18	1013	22	1002	48	101.10
B_235_48	0	80.3	294	0.27	2.5190	0.0780	3.10	0.2207	0.0051	2.31	0.0829	0.0016	1.93	0.78	1277	23	1285	27	1270	34	101.18
B_235_67	1	18.7	263.2	0.07	1.6990	0.0450	2.65	0.1700	0.0043	2.53	0.0726	0.0014	1.93	0.80	1007.9	17	1012	24	1000	39	101.20
B_235_85	1	17.52	146	0.12	1.7030	0.0430	2.52	0.1718	0.0036	2.10	0.0724	0.0016	2.21	0.32	1009.3	16	1022	20	1008	43	101.39
B_235_64	1	25.5	177.9	0.14	1.7870	0.0490	2.74	0.1765	0.0045	2.55	0.0737	0.0014	1.90	0.70	1040	18	1048	25	1032	37	101.55
B_235_3	1	9.89	104.5	0.09	1.7210	0.0490	2.85	0.1705	0.0032	1.88	0.0725	0.0015	2.07	0.83	1016	18	1014.7	18	998	42	101.67
B_235_31	0	20.3	109.2	0.19	2.1880	0.0660	3.02	0.2023	0.0050	2.47	0.0788	0.0016	2.03	0.73	1176	21	1187	27	1165	40	101.89
B_235_47	0	22.15	118.2	0.19	2.2800	0.0690	3.03	0.2075	0.0052	2.51	0.0798	0.0016	2.01	0.74	1205	21	1215	28	1191	40	102.02
B_235_8	1	21.1	176.2	0.12	1.7070	0.0500	2.93	0.1696	0.0035	2.06	0.0722	0.0014	1.94	0.82	1011	19	1010	19	990	40	102.02
B_235_66	1	70.5	262.5	0.27	2.7060	0.0690	2.55	0.2328	0.0049	2.10	0.0852	0.0017	2.00	0.64	1330	19	1349	26	1318	39	102.35
B_235_18	0	56.8	580	0.10	2.6010	0.0980	3.77	0.2275	0.0091	4.00	0.0838	0.0017	2.03	0.94	1309	28	1320	48	1285	39	102.72
B_235_36	1	84.7	224.8	0.38	2.7080	0.0740	2.73	0.2301	0.0063	2.74	0.0843	0.0015	1.78	0.82	1330	20	1335	33	1298	35	102.85
B_235_13	1	82.9	195.4	0.42	2.3960	0.0720	3.01	0.2147	0.0053	2.47	0.0809	0.0016	1.98	0.73	1247	22	1253	28	1217	39	102.96
B_235_14	0	29.5	107.7	0.27	2.3850	0.0640	2.68	0.2136	0.0043	2.01	0.0805	0.0016	1.99	0.55	1238	19	1248	23	1206	39	103.48
B_235_10	1	68.4	220	0.31	1.8480	0.0550	2.98	0.1800	0.0034	1.89	0.0737	0.0018	2.44	0.66	1062	19	1067	19	1031	48	103.49
B_235_73	1	67.8	180	0.38	2.7590	0.0750	2.72	0.2347	0.0060	2.56	0.0847	0.0016	1.89	0.81	1347	21	1359	31	1312	39	103.58
B_235_39	0	25	181.4	0.14	1.6440	0.0430	2.62	0.1655	0.0042	2.54	0.0708	0.0014	1.98	0.65	987.1	16	987	23	950	42	103.89
B_235_23	0	23.1	115.8	0.20	2.9830	0.0790	2.65	0.2466	0.0056	2.27	0.0868	0.0019	2.19	0.69	1403	20	1421	29	1360	39	104.49
B_235_81	0	87.5	276	0.32	2.0460	0.0590	2.88	0.1953	0.0044	2.25	0.0761	0.0014	1.84	0.85	1130	20	1150	23	1097	37	104.83
B_235_41	0	28.5	147	0.19	1.6890	0.0540	3.20	0.1717	0.0040	2.33	0.0710	0.0015	2.11	0.62	1003	20	1021	23	962	47	106.13
B_235_87	1	10.47	154.3	0.07	1.6310	0.0430	2.64	0.1702	0.0041	2.41	0.0701	0.0015	2.14	0.67	982	17	1013	22	927	45	109.28
B_245_15	1	47.24	112.3	0.42	2.1550	0.0920	4.27	0.1674	0.0039	2.33	0.0925	0.0035	3.78	0.25	1165	30	998	22	1482	71	67.34
B_245_32	0	110.9	1148	0.10	2.4180	0.0660	2.73	0.1932	0.0049	2.54	0.0898	0.0014	1.56	0.93	1247	20	1139	26	1422	31	80.10
B_245_28	1	51.8	792	0.07	2.4500	0.0710	2.90	0.2043	0.0058	2.84	0.0892	0.0029	3.25	0.74	1257	21	1198	31	1402	54	85.45
B_245_37	1	110.6	2153	0.05	2.1690	0.1100	5.07	0.1851	0.0055	2.97	0.0837	0.0023	2.75	0.85	1168	34	1095	30	1281	53	85.48
B_245_43	1	126.2	929	0.14	2.2640	0.0710	3.14	0.1923	0.0050	2.60	0.0849	0.0017	2.00	0.80	1200	22	1134	27	1319	44	85.97
B_245_41	1	95.8	469	0.20	1.9280	0.0590	3.06	0.1744	0.0042	2.41	0.0798	0.0017	2.13	0.77	1090	21	1036	23	1197	38	86.55
B_245_29	0	39.6	598	0.07	2.5890	0.0880	3.40	0.2093	0.0062	2.96	0.0890	0.0017	1.91	0.91	1296	25	1225	33	1408	38	87.00
B_245_30	1	104	550	0.19	3.1350	0.0840	2.68	0.2376	0.0064	2.69	0.0973	0.0027	2.77	0.69	1441	21	1374	33	1568	47	87.63
B_245_14	0	122.5	168.9	0.73	3.4510	0.0910	2.64	0.2501	0.0062	2.48	0.1003	0.0018	1.79	0.82	1516	21	1439	32	1628	33	88.39
B_245_38	1	59	517	0.11	2.8660	0.0810	2.83	0.2263	0.0059	2.61	0.0926	0.0020	2.16	0.69	1375	20	1315	31	1477	40	89.03
B_245_20	1	37	228.3	0.16	2.9370	0.0930	3.17	0.2308	0.0057	2.47	0.0921	0.0017	1.85	0.89	1391	24	1339	30	1474	33	90.84
B_245_33	1	137	430	0.32	2.9950	0.1000	3.34	0.2343	0.0065	2.77	0.0925	0.0024	2.59	0.55	1405	27	1356	34	1484	43	91.37
B_245_40	1	58.2	1293	0.05	1.7050	0.0430	2.52	0.1648	0.0035	2.12	0.0749	0.0014	1.87	0.84	1010.3	16	983	19	1071	35	91.78
B_245_27	1	42.8	610	0.07	1.9970	0.0650	3.25	0.1816	0.0052	2.86	0.0787	0.0015	1.91	0.87	1113	22	1075	28	1162	38	92.51
B_245_45	1	70.6	1163	0.06	2.3470	0.0810	3.45	0.2032	0.0050	2.46	0.0837	0.0019	2.27	0.75	1225	25	1192	27	1284	44	92.83
B_245_24	1	34.6	562	0.06	2.9650	0.0830	2.80	0.2350	0.0056	2.38	0.0918	0.0015	1.63	0.88	1398	21	1360	29	1462	31	93.02
B_245_34	0	80.3	781	0.10	2.4010	0.0850	3.54	0.2063	0.0060	2.91	0.0843	0.0021	2.49	0.78	1242	25	1209	32	1296	49	93.29
B_245_7	0	26.7	686	0.04	1.9410	0.0560	2.89	0.1813	0.0042	2.32	0.0782	0.0014	1.79	0.86	1095	19	1074	23	1151	37	93.31
B_245_4	0	58.6	632	0.09	2.2800	0.1600	7.02	0.1975	0.0088	4.46	0.0821	0.0024	2.92	0.99	1200	50	1161	47	1243	56	93.40
B_245_8	1	107.1	655	0.16	2.0150	0.0500	2.48	0.1842	0.0043	2.33	0.0786	0.0014	1.78	0.78	1120.3	17	1089	23	1165	36	93.48
B_245_19	0	35.1	199.5	0.18	3.7220	0.1200	3.22	0.2680	0.0080	2.99	0.1007	0.0019	1.89	0.93	1575	27	1530	41	1636	35	93.52
B_245_36	0	748	810	0.92	4.1060	0.1000	2.44	0.2826	0.0061	2.16	0.1045	0.0020	1.91	0.72	1655	20	1604	31	1705	35	94.08
B_245_6	0	53.6	483	0.11	2.0150	0.0670	3.33	0.1850	0.0046	2.49	0.0782	0.0014	1.79	0.87	1120	23	1094	25</			

B_245_10	0	59.9	308.6	0.19	2.1090	0.0600	2.84	0.1940	0.0048	2.47	0.0787	0.0013	1.65	0.92	1151	20	1143	26	1165	34	98.11
B_245_9	0	170.7	740	0.23	2.6400	0.0670	2.54	0.2226	0.0046	2.07	0.0852	0.0015	1.76	0.77	1314	20	1296	24	1320	35	98.18
B_245_31	0	59.3	152.9	0.39	4.4200	0.1600	3.62	0.3034	0.0100	3.30	0.1056	0.0022	2.08	0.88	1715	30	1707	51	1722	39	99.13
B_245_42	0	176.7	176.4	1.00	4.5090	0.1200	2.66	0.3055	0.0073	2.39	0.1060	0.0020	1.89	0.67	1732	21	1718	36	1731	35	99.25
B_245_5	1	92.7	131	0.71	3.0440	0.0880	2.89	0.2447	0.0057	2.33	0.0893	0.0016	1.79	0.79	1418	22	1411	29	1409	34	100.14
B_245_1	1	21.64	714	0.03	2.1780	0.0620	2.85	0.2001	0.0051	2.55	0.0789	0.0013	1.65	0.89	1173	20	1175	27	1170	31	100.43
B_245_22	1	43.3	248.7	0.17	2.0850	0.0660	3.17	0.1943	0.0054	2.78	0.0775	0.0014	1.81	0.87	1143	22	1144	29	1138	37	100.53
B_245_39	0	60.9	680	0.09	1.9860	0.0540	2.72	0.1881	0.0039	2.07	0.0764	0.0015	1.96	0.70	1110	18	1111	21	1103	39	100.73
B_245_2	0	52.2	309	0.17	2.1370	0.0620	2.90	0.1988	0.0044	2.21	0.0775	0.0013	1.68	0.82	1160	20	1169	24	1134	34	103.09
B_245_46	0	28.1	551	0.05	1.7220	0.0420	2.44	0.1718	0.0033	1.92	0.0721	0.0011	1.53	0.79	1016.7	16	1022	18	989	32	103.34
B_245_13	1	61.7	270	0.23	2.3150	0.0740	3.20	0.2123	0.0060	2.83	0.0781	0.0013	1.67	0.92	1216	23	1241	32	1148	33	108.10
C_172_3	0	0.002	1.242	0.01	1.1500	0.6100	53.04	0.0335	0.0054	16.12	0.1800	0.0600	33.33	0.98	610	200	212	33	2540	610	8.35
C_172_5	0	8.51	170	0.01	2.7300	0.8000	29.30	0.0570	0.0120	21.05	0.3680	0.0880	23.91	0.71	1230	210	357	71	3750	400	9.52
C_172_4	1	0.016	0.817	0.00	2.7000	1.1000	40.74	0.0594	0.0096	16.16	0.2670	0.0570	21.35	0.97	1060	210	370	58	3180	350	11.64
C_172_6	1	53.5	287	0.02	8.6000	2.5000	29.07	0.1030	0.0160	15.53	0.5350	0.0530	9.91	0.95	2120	220	627	91	4290	160	14.62
C_172_9	1	88.5	229.6	0.39	2.1830	0.0590	2.70	0.1955	0.0046	2.35	0.0812	0.0016	1.97	0.81	1175	19	1151	25	1224	37	94.04
C_172_7	0	10.89	131.7	0.19	1.7170	0.0560	3.26	0.1691	0.0050	2.96	0.0745	0.0017	2.28	0.78	1014	21	1007	28	1052	47	95.72
C_172_8	1	20.5	75.6	0.27	1.8430	0.0650	3.53	0.1766	0.0043	2.43	0.0757	0.0022	2.91	0.81	1060	23	1048	24	1092	54	95.97
C_172_1	0	0.014	1.471	0.05	1.7120	0.0660	3.86	0.1671	0.0055	3.29	0.0737	0.0019	2.58	0.81	1012	25	995	30	1030	52	96.60
C_172_2	1	0.008	0.597	0.08	1.7350	0.0520	3.00	0.1727	0.0042	2.43	0.0729	0.0016	2.19	0.83	1021	19	1027	23	1015	48	101.18

U and Pb content and Th/U ratio were calculated according to the nominal concentrations of Plesovice and GJ-1 reference zircons for the SGC and ETH Laboratories respectively

Decay constants of Jaffey et al. (1971) used

Measurements in italic are not plotted in figures and used in geochronological interpretations

Corrected isotope ratios: background extracted, drift and fractionation from (the nominal ID-TIMS) value of Plesovice GJ-1 reference zircons for the SGC and ETH Laboratories respectively

The ²⁰⁷Pb/²³⁵U ratio is calculated by the corrected 7/6 and 6/8 ratios as ²⁰⁷Pb/²⁰⁶Pb/(²³⁸U/²⁰⁶Pb*1/137.88).

Rho = ²⁰⁶Pb/²³⁸U/²⁰⁷Pb/²³⁵U error correlation coefficient.

All Isotopic ratios are reported with propagated uncertainties at 2σ_{sys} level, as data from different facilities (SGC-ETH) is presented as recommended by Horstwood et al., 2016

2σ_{sys}= Reproducibility of reference material uncertainty is propagated. Ages are quoted at 2 SE absolute, propagation is by quadratic addition.

Concordance = Concordance is calculated as 100*((²⁰⁶Pb/²³⁸U age)/(²⁰⁷Pb/²⁰⁶Pb age)) for grains older than 250 Ma and 100*((206Pb/238U age)/(207Pb/235U age)) for grains younger than 250 Ma

TABLE A2. Trace elements in Zircon [ppm], and Ti-in Zr Thermometry

Sample	Target	Age U ²⁰⁶ / _{Pb} ²³⁸	error 2s	Al	P	Ti	Y	Nb	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Pb	Th	U	Log Ti	T ° C
G-52d - 7	rim	170.8	4.5	Below LOD	Below LOD	Below LOD	459.00	1.05	0.27	Below LOD	1.69	Below LOD	0.33	0.89	0.17	6.50	3.58	44.20	16.20	60.20	10.60	88.70	18.20	13440	53.3	7.74	521	N/A	N/A
G-52d - 30	rim	204.5	6	Below LOD	Below LOD	Below LOD	36.40	0.43	Below LOD	0.18	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.24	2.79	1.19	5.84	1.34	17.30	3.30	12420	15.5	0.31	115.9	N/A	N/A
G-52d - 33	rim	213.8	5.9	Below LOD	Below LOD	Below LOD	26.30	0.39	0.09	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.37	3.10	0.78	3.47	0.69	6.30	1.16	11600	20.24	2.82	140	N/A	N/A
G-52d - 44	rim	218.7	7.3	Below LOD	Below LOD	Below LOD	54.10	0.53	0.14	Below LOD	0.68	Below LOD	0.27	0.37	0.29	1.87	0.76	6.07	1.57	5.47	1.02	7.09	1.01	9940	26.4	6.43	179	N/A	N/A
G-52d - 58	rim	219.9	6.1	290	Below LOD	Below LOD	106.70	0.34	0.27	Below LOD	0.99	0.05	0.52	0.82	0.62	4.60	1.30	11.80	3.29	11.20	1.90	14.90	2.84	9910	38.6	20.3	266	N/A	N/A
G-52d - 54	core	220.1	5.8	Below LOD	119	Below LOD	88.90	0.70	1.89	Below LOD	1.12	Below LOD	0.60	1.98	0.74	9.90	2.12	14.20	2.81	8.62	1.21	9.80	1.58	10980	43.5	19.9	310	N/A	N/A
G-52d - 25	rim	222.5	5.5	Below LOD	Below LOD	Below LOD	199.00	1.96	0.12	Below LOD	0.43	Below LOD	Below LOD	0.47	0.29	3.81	1.68	18.30	6.40	27.10	5.51	54.00	10.15	10840	85.9	5.57	606	N/A	N/A
G-52d - 69	core	222.9	6.6	Below LOD	Below LOD	Below LOD	66.80	0.44	Below LOD	Below LOD	0.21	Below LOD	Below LOD	0.42	0.19	1.95	0.58	6.40	2.08	8.10	1.57	16.00	3.46	9770	14.1	1.91	96.7	N/A	N/A
G-52d - 70	rim	223.6	5.7	Below LOD	102	Below LOD	36.60	0.53	Below LOD	Below LOD	0.78	Below LOD	Below LOD	0.12	0.14	1.48	0.47	3.96	1.22	4.74	0.94	10.00	1.58	11120	36	7.96	252.8	N/A	N/A
G-52d - 17	rim	223.8	6.4	Below LOD	Below LOD	Below LOD	73.50	0.51	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.14	1.40	0.58	7.32	2.06	8.33	1.55	11.90	2.24	10050	17.68	0.18	123.6	N/A	N/A
G-52d - 15	rim	225	5.6	Below LOD	Below LOD	Below LOD	106.40	0.49	1.13	Below LOD	0.63	Below LOD	Below LOD	0.38	0.20	3.00	0.98	10.60	3.62	14.20	3.17	28.10	6.12	11330	46.9	7.57	324	N/A	N/A
G-52d - 42	rim	225	5.1	Below LOD	Below LOD	Below LOD	49.00	1.28	Below LOD	Below LOD	1.05	Below LOD	0.35	0.79	0.41	5.01	1.45	8.01	1.63	5.02	0.79	4.17	0.65	10520	42.7	14.07	291	N/A	N/A
G-52d - 8	core	225.1	4.9	Below LOD	Below LOD	Below LOD	217.60	2.15	Below LOD	Below LOD	0.71	Below LOD	Below LOD	0.64	0.44	4.25	1.83	20.40	7.16	28.80	5.83	53.90	11.42	10280	81.7	7.01	560	N/A	N/A
G-52d - 51	rim	225.1	5.8	Below LOD	Below LOD	Below LOD	105.90	0.41	Below LOD	Below LOD	0.69	Below LOD	Below LOD	0.37	0.27	3.90	1.06	9.20	3.18	13.40	2.97	24.20	4.49	10960	48.2	10	338	N/A	N/A
G-52d - 9	rim	225.2	5.8	Below LOD	80	Below LOD	35.70	0.33	0.19	Below LOD	0.30	Below LOD	Below LOD	Below LOD	0.07	0.84	0.42	3.35	1.15	5.02	1.04	10.00	2.39	11860	17.56	2.57	123.9	N/A	N/A
G-52d - 43	core	225.4	5.5	Below LOD	Below LOD	Below LOD	101.70	0.93	0.16	0.12	1.49	0.06	0.95	2.77	0.98	12.70	2.55	15.80	3.21	9.20	1.43	10.50	1.75	10400	55.3	23.29	373	N/A	N/A
G-52d - 46	rim	225.6	5.8	Below LOD	Below LOD	Below LOD	40.90	0.49	Below LOD	Below LOD	0.41	Below LOD	Below LOD	0.17	0.21	1.63	0.48	4.39	0.95	3.58	0.56	3.92	0.82	10990	54	5.43	367	N/A	N/A
G-52d - 26	core	225.8	5	Below LOD	Below LOD	Below LOD	254.00	1.98	0.25	Below LOD	0.24	Below LOD	Below LOD	0.55	0.45	4.90	1.77	20.00	8.45	36.40	7.83	68.80	14.30	10650	92.4	4.04	658	N/A	N/A
G-52d - 63	core	225.8	6.3	Below LOD	Below LOD	Below LOD	82.90	Below LOD	Below LOD	Below LOD	0.36	Below LOD	Below LOD	0.30	0.25	1.90	0.86	7.68	2.73	10.00	2.44	19.50	4.35	10450	32.6	1.85	217.2	N/A	N/A
G-52d - 71	core	225.9	6.1	Below LOD	Below LOD	Below LOD	97.70	0.73	Below LOD	Below LOD	1.27	Below LOD	0.44	0.48	0.33	3.50	1.17	11.50	3.00	8.57	1.64	11.30	1.67	10100	35.4	7.21	250	N/A	N/A
G-52d - 23	core	226.1	5.4	Below LOD	Below LOD	Below LOD	91.80	0.63	Below LOD	Below LOD	0.83	Below LOD	Below LOD	0.94	0.47	5.42	1.65	12.50	3.22	10.35	1.63	15.20	3.17	10590	43.1	13.28	300	N/A	N/A
G-52d - 20	rim	226.3	5.2	Below LOD	Below LOD	Below LOD	47.30	0.81	Below LOD	Below LOD	0.57	Below LOD	Below LOD	0.34	0.22	3.13	0.92	6.00	1.44	4.16	0.73	4.91	0.65	10270	43.2	9.71	295	N/A	N/A
G-52d - 55	core	226.6	5.6	Below LOD	Below LOD	Below LOD	59.20	0.53	Below LOD	Below LOD	0.60	Below LOD	0.19	0.73	0.58	4.00	1.17	7.76	1.85	5.34	0.70	6.60	1.23	10490	31.6	7.79	219	N/A	N/A
G-52d - 49	rim	226.7	5.7	Below LOD	Below LOD	Below LOD	175.00	0.88	Below LOD	Below LOD	0.73	Below LOD	0.32	0.88	0.31	4.60	1.58	17.00	5.47	22.50	4.64	41.40	8.40	10790	54.2	8	364	N/A	N/A
G-52d - 36	rim	227	5.4	Below LOD	Below LOD	Below LOD	72.80	0.47	Below LOD	0.16	0.51	Below LOD	0.30	0.20	0.18	1.29	0.81	6.60	2.35	10.51	2.20	19.50	4.01	11070	57.3	7.59	390	N/A	N/A
G-52d - 68	rim	227.1	6.3	Below LOD	Below LOD	22	53.10	0.54	0.26	Below LOD	0.69	Below LOD	Below LOD	0.57	0.53	4.40	0.98	8.70	1.54	4.49	0.60	5.40	0.94	12550	34.5	11	241	1.3	815.2
G-52d - 65	core	227.2	5.3	Below LOD	Below LOD	Below LOD	95.90	0.78	Below LOD	0.15	0.53	Below LOD	0.19	0.56	0.41	2.72	1.29	9.30	2.72	10.50	2.30	22.10	5.85	11150	52.5	8.57	358	N/A	N/A
G-52d - 37	core	227.6	5.5	Below LOD	Below LOD	Below LOD	160.90	0.91	0.16	Below LOD	0.45	Below LOD	Below LOD	0.37	0.34	3.80	1.41	15.10	5.11	21.10	4.43	39.20	8.04	11090	52.2	8.48	363	N/A	N/A
G-52d - 53	rim	227.7	6	Below LOD	Below LOD	Below LOD	76.00	0.82	0.20	Below LOD	1.11	Below LOD	0.40	1.35	0.62	7.26	1.76	11.39	2.44	5.76	1.04	6.74	1.06	10930	41.8	12.92	285	N/A	N/A
G-52d - 72	rim	227.9	5.7	Below LOD	Below LOD	Below LOD	60.20	0.66	Below LOD	Below LOD	0.66	Below LOD	Below LOD	0.72	0.28	3.32	1.70	7.89	1.76	5.35	0.94	6.80	1.10	10680	43.5	9.66	304	N/A	N/A
G-52d - 62	core	228.1	5.9	Below LOD	Below LOD	Below LOD	102.20	0.69	2.10	Below LOD	0.67	Below LOD	Below LOD	0.29	0.21	2.61	0.98	10.80	3.49	13.50	3.13	33.90	7.65	11340	34	4.62	234	N/A	N/A
G-52d - 31	core	228.4	6.3	Below LOD	Below LOD	Below LOD	46.30	Below LOD	Below LOD	Below LOD	0.50	Below LOD	Below LOD	0.24	0.27	1.64	0.42	4.55	1.33	6.96	1.47	15.00	3.68	10330	19.2	5.84	132.7	N/A	N/A
G-52d - 3	core	228.8	5.4	Below LOD	Below LOD	Below LOD	50.50	0.62	Below LOD	Below LOD	0.80	Below LOD	0.23	0.73	0.52	3.88	0.98	6.73	1.59	4.38	0.81	5.69	1.22	11280	43.9	17.85	299	N/A	N/A
G-52d - 75	core	228.9	6.1	Below LOD	Below LOD	Below LOD	32.70	0.87	0.12	Below LOD	0.83	Below LOD	0.35	0.34	0.29	2.31	0.60	4.57	1.11	2.79	0.51	4.35	0.72	11230	33.5	12.09	229	N/A	N/A
G-52d - 39	rim	229.3	5.5	Below LOD	Below LOD	Below LOD	23.50	0.46	Below LOD	Below LOD	0.59	Below LOD	Below LOD	0.40	0.18	1.46	0.49	3.52	0.79	2.07	0.30	2.41	0.36	11340	38.2	9.6	261	N/A	N/A
G-52d - 22	rim	229.7	5.7	Below LOD	Below LOD	Below LOD	33.10	0.70	Below LOD	Below LOD	0.78	Below LOD	Below LOD	0.43	0.29	3.02	0.70	4.62	1.19	3.54	0.59	4.43	0.80	10940	42.6	10.86	292	N/A	N/A
G-52d - 10	core	229.8	5.2	Below LOD	Below LOD	Below LOD	206.00	0.70	Below LOD	0.13	0.64	Below LOD	0.45	1.56	0.79	9.80	2.64	25.00	7.04	23.90	4.50	37.50	6.78	10970	70.9	25.3	497	N/A	N/A
G-52d - 35	core	230.8	5.4	Below LOD	Below LOD	Below LOD	46.50	0.64	0.13	Below LOD	0.76	Below LOD	0.26	0.49	0.44	3.82	0.90	5.94	1.33	3.91	0.57	6.02	0.94	13050	45.3	19.5	306	N/A	N/A
G-52d - 57	rim	230.8	5.2	Below LOD	Below LOD	Below LOD	149.40	2.17	Below LOD	Below LOD	0.64	Below LOD	Below LOD	0.27	0.23	3.32	1.28	13.60	5.04	18.70	4.19	35.90	7.28	11230	75.4	5.92	510	N/A	N/A
G-52d - 48	core	230.9	6.4	Below LOD	Below LOD	Below LOD	112.80	0.81	Below LOD	Below LOD	0.74	Below LOD	0.37	0.55	0.30	3.26	1.26	11.20	3.71	13.60	3.24	26.60	5.35	10920	39	11.5	261	N/A	N/A
G-52d - 41	rim	231.1	5.5	Below LOD	Below LOD	Below LOD	18.71	0.84	Below LOD	Below LOD	0.72	Below LOD	Below LOD	0.23	0.15	1.26	0.39	3.39	0.66	1.56	0.26	1.89	0.29	11690	46	13.87	305.7	N/A	N/A
G-52d - 29	core	231.5	5.9	Below LOD	Below LOD	Below LOD	41.50	Below LOD	Below LOD	Below LOD	0.55	Below LOD	0.31	0.27	0.25	2.45	0.78	5.14	1.20	3.72	0.60	3.43	0.68	11080	26.4	6.16	178	N/A	N/A
G-52d - 66	rim	231.6	7.1	Below LOD	Below LOD	Below LOD	37.10	Below LOD	Below LOD	Below LOD	0.36	Below LOD	Below LOD	0.39	0.22	2.11	0.50	5.27	1.44	3.92	0.63	4.47	0.81	9870	11.69	4.74	80.2	N/A	N/A
G-52d - 18	core	231.8	7.1	Below LOD	Below LOD	Below LOD	61.80	0.66	Below LOD	0.14	Below LOD	Below LOD	Below LOD	Below LOD	0.09	1.12	0.40	5.75	1.93	6.80	1.17	9.20	1.89	9550	20	0.157	129.4	N/A	N/A
G-52d - 38	core	231.9	5.7	Below LOD	Below LOD	Below LOD	102.50	0.48	Below LOD	Below LOD	0.76	Below LOD	0.33	1.17	0.66	6.06	1.74	13.70	3.41	8.79	1.57	9.25	1.69	10080	42.5	12.43	287	N/A	N/A
G-52d - 47	core	232.2	5.7	Below LOD	Below LOD	Below LOD	32.50	0.67	Below LOD	Below LOD	0.42	0.03	Below LOD	0.23	0.18	1.54	0.50	3.73	0.91	2.69	0.48	3.55	0.56	11110	53	4.83	355	N/A	N/A
G-52d - 12	core	232.5	6.1	Below LOD	Below LOD	Below LOD	102.90	0.68	Below LOD	Below LOD	0.77	Below LOD	0.37	0.91	0.55	5.61													

G-54 - 39	rim	229.8	5	Below LOD	Below LOD	Below LOD	261.00	0.46	Below LOD	Below LOD	0.47	Below LOD	0.33	0.87	0.31	6.64	2.82	28.60	9.20	31.30	5.80	43.40	8.01	12280	99.6	11.24	665	N/A	N/A
G-54 - 44	core	230.2	5	Below LOD	115	Below LOD	204.00	1.30	Below LOD	Below LOD	1.30	0.06	0.62	2.40	0.46	15.20	4.53	32.60	6.89	19.90	3.17	24.00	4.25	11230	60.5	19.3	412	N/A	N/A
G-54 - 45	core	231	5.3	Below LOD	180	Below LOD	170.70	0.62	Below LOD	Below LOD	0.80	0.06	0.62	2.38	0.39	19.10	4.68	31.80	5.87	13.25	2.21	13.80	2.52	11880	51.8	13.6	351	N/A	N/A
G-54 - 72	core	234.1	5.4	Below LOD	158	Below LOD	336.00	1.11	Below LOD	Below LOD	1.20	Below LOD	0.78	5.07	0.64	36.90	11.31	73.40	11.79	23.70	2.45	11.40	1.03	14560	372	32.2	2500	N/A	N/A
G-54 - 43	rim	234.1	6.5	Below LOD	Below LOD	Below LOD	156.00	0.68	Below LOD	Below LOD	0.57	0.04	0.47	1.86	0.27	12.30	3.89	26.40	5.25	13.12	1.81	14.10	2.53	11990	59.8	11.62	401	N/A	N/A
G-54 - 33	core	234.4	4.9	Below LOD	145	Below LOD	240.00	0.84	Below LOD	Below LOD	0.61	Below LOD	0.19	1.03	0.26	8.80	3.25	31.10	7.51	27.50	5.03	44.60	9.63	12710	183	12.18	1200	N/A	N/A
G-54 - 59	rim	234.7	8.7	Below LOD	270	Below LOD	261.00	4.70	1.15	Below LOD	0.32	0.03	0.24	0.62	0.21	5.50	2.67	28.10	8.50	35.00	8.30	85.00	17.30	12380	122.2	10.3	840	N/A	N/A
G-54 - 49	rim	235.8	5.5	Below LOD	173	Below LOD	233.20	0.66	Below LOD	Below LOD	0.89	Below LOD	0.64	2.12	0.33	12.80	4.26	33.10	8.26	26.40	4.87	40.40	6.96	12690	104.1	11.27	686	N/A	N/A
G-54 - 73	rim	235.9	6.5	Below LOD	230	Below LOD	252.80	0.95	3.53	0.29	1.28	0.07	0.65	1.44	0.43	10.60	3.89	33.30	8.23	28.20	4.62	40.40	7.81	12590	65.2	11.83	412	N/A	N/A
G-54 - 62	rim	237.4	5.3	Below LOD	155	Below LOD	608.00	3.66	0.66	0.44	9.00	0.18	1.41	2.01	0.40	10.90	4.06	48.30	19.60	97.00	23.40	249.00	55.40	12120	87.9	69	585	N/A	N/A
G-54 - 25	core	239.6	6.1	Below LOD	254	Below LOD	533.00	2.34	1.98	1.36	10.70	2.05	14.70	13.80	2.01	38.50	10.59	79.50	18.20	50.70	7.98	57.80	9.34	11900	131	55.5	820	N/A	N/A
G-54 - 37	rim	240.4	8.3	Below LOD	Below LOD	Below LOD	244.00	8.30	0.12	Below LOD	0.56	Below LOD	0.19	0.43	0.13	3.66	1.56	19.40	7.73	44.70	15.40	192.00	40.60	12550	73.5	6.98	496	N/A	N/A
G-54 - 90	rim	241.2	44	828	Below LOD	86	197.00	1.69	19.80	Below LOD	0.77	0.07	0.45	2.68	0.38	16.50	4.96	32.40	6.56	16.10	2.69	19.60	3.70	12370	56.3	12.43	387	1.9	973.3
G-54 - 16	core	246.8	5.9	Below LOD	530	7.3	2084.00	4.25	0.61	Below LOD	16.50	0.21	3.76	9.60	0.55	53.80	18.39	209.00	74.60	308.00	62.40	520.00	95.50	9750	88.5	413	553	0.9	713.9
G-54 - 55	rim	248.7	14	Below LOD	230	11.5	422.00	1.58	0.80	Below LOD	0.78	Below LOD	0.52	1.31	0.24	10.10	3.70	31.30	12.37	69.10	19.10	214.00	51.60	12590	100.2	19.4	674	1.1	753.3
G-54 - 13	rim	249.4	6.3	Below LOD	380	Below LOD	853.00	3.57	3.70	6.10	20.00	1.50	6.90	2.50	0.28	11.80	4.95	67.00	27.30	144.00	35.40	360.00	78.70	12690	69.9	153	431	N/A	N/A
G-54 - 38	core	253.8	65	Below LOD	Below LOD	Below LOD	225.00	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	24.60	Below LOD	29.70	Below LOD	63.00	Below LOD	12910	82.2	Below LOD	561	N/A	N/A	
G-54 - 79	rim	258.8	7	522	360	Below LOD	684.00	2.56	3.20	4.11	30.90	4.50	27.90	23.20	3.74	44.00	13.40	103.70	25.80	82.80	13.08	99.70	18.30	13650	595	150	3500	N/A	N/A
G-54 - 83	core	262.9	5.7	Below LOD	Below LOD	Below LOD	1135.00	1.89	0.45	Below LOD	25.50	0.16	3.16	5.71	1.64	25.00	8.24	92.60	37.60	174.30	40.90	426.00	91.10	11090	110.5	544	654	#VALUE!	#VALUE!
G-54 - 14	core	263.5	6.4	119	1290	Below LOD	3180.00	5.47	1.83	41.00	134.00	15.50	71.00	21.60	1.95	60.50	19.90	261.00	110.40	549.00	125.00	1169.00	240.00	8840	65.7	260	397	N/A	N/A
G-54 - 6	core	265.5	6.3	Below LOD	310	12.2	544.00	2.91	0.86	Below LOD	16.60	0.07	0.80	2.11	0.76	10.20	3.90	47.70	18.80	84.20	18.70	173.00	34.00	10410	99.5	28.1	571	1.1	758.6
G-54 - 31	core	267.9	7.5	268	520	12.2	628.00	7.70	7.40	0.17	1.48	0.10	0.97	1.47	0.40	6.20	3.57	42.60	19.10	108.80	30.50	325.00	60.00	12050	155.4	23.7	849	1.1	758.6
G-54 - 2	core	274	8.1	Below LOD	460	Below LOD	836.00	0.80	0.28	0.38	13.70	0.36	4.09	4.08	1.39	18.40	5.83	70.20	26.60	131.00	31.10	314.00	68.10	10490	18.1	79.8	105.3	N/A	N/A
G-54 - 63	core	276.9	6.5	Below LOD	178	Below LOD	930.00	3.04	0.08	Below LOD	23.10	0.06	0.82	2.29	0.30	13.60	5.43	69.60	31.00	156.50	36.30	365.00	75.00	13030	68.3	225	384	N/A	N/A
G-54 - 66	rim	280.1	25	Below LOD	Below LOD	Below LOD	258.00	0.38	0.13	Below LOD	0.93	Below LOD	0.24	0.38	0.16	7.40	2.48	28.90	9.20	33.30	6.41	56.90	10.30	13240	165	24.2	1030	N/A	N/A
G-54 - 1	core	296.2	11	Below LOD	370	Below LOD	965.00	8.34	0.39	Below LOD	22.80	0.05	0.68	2.01	0.54	14.10	5.55	72.90	31.50	172.00	43.80	409.00	74.10	11360	106.2	53	542	N/A	N/A
G-54 - 70	rim	300.1	8.9	Below LOD	265	Below LOD	505.00	8.70	1.08	Below LOD	0.33	Below LOD	0.28	0.37	0.11	2.39	1.41	23.20	14.40	103.60	34.20	384.00	75.10	12050	115.8	24.2	574	N/A	N/A
G-54 - 18	core	301	89	Below LOD	290	10.3	842.00	4.75	0.61	Below LOD	6.40	0.02	0.87	1.21	0.20	9.30	3.57	50.50	25.70	154.00	44.50	438.00	86.20	12370	210	56.4	1146	1.0	743.4
G-54 - 42	core	302.2	9.7	Below LOD	228	Below LOD	348.00	1.40	0.13	Below LOD	3.90	0.09	0.78	1.91	0.08	9.40	3.38	33.20	11.68	48.10	9.97	79.90	16.37	10840	52.9	71.3	262	N/A	N/A
G-54 - 57	core	302.5	21	Below LOD	430	Below LOD	1423.00	11.00	0.71	Below LOD	8.30	0.07	1.41	2.78	0.65	17.00	7.77	104.70	46.80	257.00	70.50	717.00	135.40	12220	105.1	84.8	568	N/A	N/A
G-54 - 53	core	307.5	6.5	129	470	36	1640.00	4.29	2.18	Below LOD	19.30	0.17	2.72	5.55	1.18	30.40	10.90	131.00	53.30	262.00	59.70	605.00	127.50	8030	121.3	332	616	1.6	867.5
G-54 - 69	rim	311.3	11	Below LOD	132	Below LOD	343.00	1.76	0.35	Below LOD	2.60	Below LOD	0.48	0.96	0.19	7.40	2.50	29.80	10.96	50.60	10.87	105.10	22.20	11910	113.2	25.3	592	N/A	N/A
G-54 - 24	rim	312.6	6.6	Below LOD	143	Below LOD	544.00	3.08	0.17	Below LOD	7.83	0.03	0.30	0.90	0.14	7.11	2.96	40.10	17.12	84.80	21.10	212.00	46.80	11440	113.7	113.9	547	N/A	N/A
G-54 - 20	core	337.8	9.5	690	155	60	588.00	5.49	10.50	Below LOD	3.40	0.07	0.93	1.88	0.35	9.84	3.77	44.80	18.60	109.80	32.60	362.00	76.30	10090	47.3	35.9	228	1.8	927.3
G-54 - 86	rim	342	7.4	Below LOD	240	Below LOD	408.00	2.39	0.19	0.11	2.43	Below LOD	0.29	0.95	0.21	7.50	3.08	34.70	13.30	66.30	15.70	160.70	33.20	12420	169.4	30	780	N/A	N/A
G-54 - 67	core	372.9	8.1	Below LOD	330	Below LOD	540.00	2.84	Below LOD	0.15	1.61	0.05	0.65	1.30	0.12	8.00	3.22	41.90	18.20	90.50	20.20	201.00	38.20	14020	165	66.5	673	N/A	N/A
G-54 - 81	core	377.9	16	250	330	29	1155.00	3.49	7.80	Below LOD	7.45	0.08	0.87	3.49	1.10	19.10	7.39	96.30	41.20	192.00	40.80	395.00	81.40	8610	80.5	111.4	312	1.5	843.9
G-54 - 75	core	395.8	9.1	Below LOD	204	Below LOD	547.00	19.30	0.60	Below LOD	7.12	0.06	0.60	1.41	0.19	10.00	3.19	43.90	18.20	98.60	24.10	261.00	55.90	11880	104.9	34.6	412	N/A	N/A
G-54 - 64	core	399	9.8	Below LOD	450	Below LOD	1306.00	1.75	1.07	Below LOD	2.63	0.09	1.27	2.96	0.10	20.60	8.54	109.20	44.40	206.00	45.70	418.00	82.30	11760	75.4	70.3	288	N/A	N/A
G-54 - 88	rim	441.3	12	1340	154	109	283.00	Below LOD	25.60	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	27.30	Below LOD	41.10	Below LOD	89.00	Below LOD	11680	107.7	43.1	369	2.0	1005.6	
G-54 - 60	core	443.8	14	Below LOD	200	Below LOD	303.00	0.78	0.18	Below LOD	3.51	0.14	1.38	4.22	0.08	25.50	6.98	53.70	10.38	23.30	2.67	15.40	1.98	13520	138.1	56	452	N/A	N/A
G-54 - 8	core	470.4	10	Below LOD	Below LOD	Below LOD	1360.00	1.80	0.22	Below LOD	19.97	0.18	2.13	4.27	0.41	23.30	8.90	108.30	44.40	221.30	52.10	484.00	89.10	6520	395	610	1275	N/A	N/A
G-54 - 5	core	477	27	Below LOD	260	Below LOD	597.00	11.90	0.52	Below LOD	3.06	Below LOD	0.39	0.78	0.19	7.43	3.05	43.20	19.20	112.00	33.40	375.00	84.30	12580	133.1	38.1	395	N/A	N/A
G-54 - 23	core	514.9	12	170	370	Below LOD	1399.00	4.49	1.34	0.33	35.70	0.31	3.29	6.05	1.85	33.00	10.86	126.80	48.10	219.00	47.50	440.00	87.10	8780	105.6	205	302	N/A	N/A
G-54 - 85	core	518	12	742	3480	48.1	1060.00	2.85	2.52	28.00	102.00	13.20	70.00	22.50	1.78	39.40	10.10	104.00	39.00	170.00	35.80	325.00	64.20	11290	78.9	126.1	241	1.7	900.6
G-54 - 15	core	539.6	12	Below LOD	Below LOD	Below LOD	503.00	7.41	0.85	1.36	55.70	1.16	7.60	5.90	1.42	11													

G-52a - 33	rim	178.3	13	1100	1850	77	6040.00	18.10	31.10	43.40	282.00	37.90	232.00	191.00	52.60	442.00	141.00	1160.00	220.00	537.00	86.30	608.00	74.90	3.36E+04	585	230	5300	1.9	958.8			
G-52a - 22	rim	178.4	14	3070	1330	47.6	4080.00	9.11	30.70	43.60	257.00	32.80	189.70	145.10	37.60	324.00	96.20	757.00	143.70	363.00	56.20	389.00	48.40	2.96E+04	464	631	4100	1.7	899.4			
G-52a - 34	rim	180.7	14	800	1200	13.9	2650.00	6.61	19.30	43.00	123.00	21.70	110.00	74.00	16.80	173.00	51.90	414.00	88.00	250.00	49.30	433.00	72.10	2.32E+04	364	428	3220	1.1	770.6			
G-52a - 21	rim	182.1	14	1070	1410	20.8	4000.00	8.13	13.00	33.80	136.00	21.30	120.00	98.30	22.60	247.00	78.70	624.00	120.30	328.00	56.60	436.00	62.10	22380	476	206	4000	1.3	809.6			
G-52a - 44	core	182.4	14	483	920	10.3	2100.00	6.06	14.30	18.20	75.60	12.98	77.30	60.60	14.80	144.00	46.40	371.00	78.50	218.00	39.10	317.00	44.10	26580	331	417	2840	1.0	743.4			
G-52a - 26	rim	183.8	14	490	730	7.70	1443.00	4.53	10.30	1.13	8.70	0.68	4.26	4.20	1.19	19.80	9.73	126.40	43.70	200.60	50.90	540.00	109.50	16750	271.6	51.4	2320	1.1	753.3			
G-52a - 43	core	184.2	14	6390	1330	67.8	2480.00	5.63	55.30	15.70	93.00	14.50	89.20	66.50	17.00	141.00	45.30	408.00	92.10	278.00	52.40	439.00	72.80	1.92E+04	401	407	3380	1.8	942.5			
G-52a - 49	core	187.4	14	65	990	Below LOD		7.89	0.56	0.78	3.54	0.55	3.40	4.98	1.20	34.70	17.86	222.80	67.80	235.10	44.40	376.00	57.60	22500	691	54.4	5650	N/A	N/A			
G-52a - 47	core	188	15	1380	1600	29.8	4160.00	8.00	33.00	50.70	195.00	31.50	173.00	136.80	31.90	292.00	95.10	776.00	157.20	464.00	82.90	679.00	106.40	21930	530	342	4290	1.5	846.8			
G-52a - 8	core	189.1	15	1670	2070	52.9	5110.00	13.35	35.10	38.60	249.00	39.80	235.00	187.00	48.00	359.00	117.80	967.00	188.00	509.00	84.50	639.00	85.90	22140	656	506	5340	1.7	912.0			
G-52a - 40	core	189.1	16	1350	1680	53.5	2800.00	7.58	87.00	56.40	131.00	20.20	93.00	47.80	13.07	121.40	39.50	375.00	93.70	353.00	85.10	958.00	185.50	18480	559	349	4590	1.7	913.3			
G-52a - 11	core	189.7	15	10190	1800	557	4190.00	19.00	151.00	46.00	225.00	32.80	182.50	148.60	39.30	297.00	92.30	756.00	150.50	406.00	66.40	484.00	62.70	21720	548	446	4630	2.7	1283.2			
G-52a - 56	rim	191.3	16	3010	1620	39.5	4330.00	18.70	40.50	54.80	216.00	32.10	180.00	142.10	35.60	329.00	101.40	804.00	169.10	488.00	86.10	741.00	126.00	3.04E+04	473	519	3910	1.6	877.9			
G-52a - 42	rim	191.8	15	1480	1740	54	3950.00	13.20	18.40	31.20	171.00	26.50	157.10	121.80	34.00	290.00	92.00	747.00	143.70	386.00	55.90	391.00	53.20	3.07E+04	477	266	3810	1.7	914.4			
G-52a - 30	core	192.2	14	1440	2260	87.9	6600.00	12.80	31.90	88.40	314.00	49.70	283.00	221.00	54.40	528.00	157.40	1214.00	233.00	569.00	87.90	595.00	75.20	24110	573	2770	4570	1.9	976.2			
G-52a - 38	rim	192.6	14	345	820	100	1342.00	1.91	7.00	2.59	8.30	1.85	11.80	11.60	2.83	34.70	13.36	152.90	50.00	225.40	58.60	644.00	132.70	14240	191.8	77.2	1513	2.0	993.7			
G-52a - 13	core	194.6	15	541	1160	15.2	2490.00	5.05	9.60	14.60	61.00	9.60	61.00	46.30	13.50	127.00	40.40	359.00	83.80	265.00	55.50	550.00	100.00	27860	395	134	3060	1.2	779.0			
G-52a - 41	rim	208.9	17	1940	1720	241.0	4290.00	11.80	22.50	93.00	241.00	37.20	196.00	122.80	35.80	293.40	90.50	742.00	151.10	409.00	64.00	468.00	70.40	2.76E+04	469	233	3470	1.7	898.2			
G-52a - 6	core	217	18	3630	1630	53.9	3570.00	13.90	25.90	39.90	211.00	32.20	201.00	157.00	40.00	370.00	99.00	770.00	141.00	425.00	68.20	543.00	86.40	2.77E+04	505	3.10E+03	3590	1.7	914.2			
G-52a - 55	core	218.1	18	770	500	11.3	1036.00	3.88	12.90	2.55	4.69	1.10	7.30	8.40	1.57	30.30	11.32	116.90	31.10	115.50	25.60	262.00	49.70	21780	327	33.5	2330	1.1	751.7			
G-52a - 48	rim	260	22	1940	1490	190	2890.00	19.50	55.00	28.30	158.00	24.80	143.00	121.00	31.00	239.00	77.50	614.00	117.00	357.00	70.30	628.00	104.00	26840	596	681	3610	2.3	1088.3			
G-55b - 14	rim	150.3	11	Below LOD		124	Below LOD		672.00	1.36	Below LOD		11.65	Below LOD		0.38	1.51	0.29	9.82	3.75	50.80	21.30	106.90	25.70	273.00	57.00	13340	23.5	137	253	N/A	N/A
G-55b - 13	core	161.1	12	Below LOD		1.22E+04	7.5	642.00	0.65	5.00	122.00	280.00		35.70	167.00	36.80	3.14	43.70	7.73	66.90	21.60	19.33	186.70	36.20	10180	9.88	74.4	96.8	0.9	716.2		
G-55b - 77	rim	163.8	12	Below LOD		260	Below LOD		595.00	0.87	Below LOD		Below LOD		0.38	0.17	6.26	3.85	54.10	20.61	86.50	16.22	139.80	26.80	13220	148.7	16.77	1439	N/A	N/A		
G-55b - 26	rim	177.5	14	Below LOD		308	12.9	2920.00	2.92	0.39	0.17	65.90	1.13	17.40	24.70	11.39	96.50	26.90	287.00	98.20	415.00	89.50	851.00	172.30	7330	11.42	177.2	100.4	1.1	763.7		
G-55b - 27	core	179.5	15	Below LOD		138	7.7	1317.00	1.32	0.27	Below LOD		26.90	0.38	6.57	9.60	4.46	40.70	11.90	132.00	46.40	201.00	43.80	422.00	84.50	7610	5.2	71.8	46.8	0.9	718.4	
G-55b - 32	rim	187.8	14	960	401	59.5	1912.00	9.24	2.87	33.40	110.10	16.80	89.90	50.30	25.50	95.80	24.80	231.00	68.80	283.00	57.60	521.00	88.80	19190	322.8	325	2696	1.8	926.2			
G-55b - 54	rim	199.3	15	700	1160	69	2640.00	3.54	6.40	24.30	98.00	12.30	69.00	36.20	19.70	70.00	22.20	250.00	88.50	396.00	88.50	835.00	158.00	13390	255	84						

G-55b - 4	core	3221	200	Below LOD	467	23.1	3630.00	9.71	0.19	1.90	37.60	1.80	19.00	24.70	3.31	114.00	32.70	372.00	130.00	538.00	108.60	958.00	178.70	8660	772	231	299	1.4	820.2
G_95_30	core	435	33	187	1940	19.8	4070.00	55.30	3.31	6.90	32.20	4.87	30.20	23.00	2.50	77.80	27.30	324.00	126.60	582.00	130.00	1226.00	235.10	11970	1201	533	4130	1.3	804.6
G_95_29	rim	629	46	426	2860	13.1	5320.00	33.90	3.10	34.00	96.00	9.70	49.00	23.30	0.97	86.20	33.10	424.00	168.50	780.00	170.50	1492.00	279.30	10160	1476	846	3400	1.1	765.1
G_95_3	core	664	50	93	1460	13.5	3950.00	43.70	5.85	7.30	32.80	4.06	26.40	20.90	2.58	77.70	27.50	328.00	122.90	550.00	122.00	1134.00	217.60	11080	1835	694	4160	1.1	767.9
G_95_33	core	673	49	1780	1.14E+04	12	4050.00	47.30	6.93	59.00	196.00	32.80	187.00	85.00	5.40	155.00	38.50	368.00	123.20	537.00	121.40	1155.00	221.10	12490	1249	398	2843	1.1	757.1
G_95_15	rim	681	53	72	1290	12.6	2760.00	57.60	3.41	1.60	21.50	1.14	6.90	5.08	0.70	30.00	14.03	204.00	82.50	392.00	86.20	782.00	145.70	12220	1393	307	3060	1.1	761.6
G_95_24	core	730	58	203	2640	49.1	3870.00	54.20	3.31	36.00	88.00	17.60	99.00	56.20	7.21	123.20	34.00	340.00	109.70	503.00	114.20	1165.00	236.50	11430	1382	284	2740	1.7	903.1
G_95_6	core	737	53	1.24E+04	1.91E+06	316	399000.00	13.60	16000.00	2010000.00	4240000.00	520000.00	2060000.00	387000.00	2970.00	276000.00	29000.00	106900.00	14000.00	23600.00	2020.00	8950.00	986.00	8.7	2.75E+04	1.21E+06	5.65E+04	2.5	1174.0
G_95_21	rim	743	53	Below LOD	1580	9.7	3590.00	45.10	2.18	12.50	17.70	7.62	49.30	30.60	4.17	86.80	25.80	287.00	102.30	466.00	105.20	1032.00	198.10	12200	1218	292.4	2514	1.0	738.2
G_95_28	rim	785.4	56	66	1830	9.4	4310.00	53.60	2.15	5.33	40.90	3.64	23.90	19.20	2.59	80.60	29.00	357.00	136.30	617.00	134.10	1222.00	221.80	11320	1420	674	2702	1.0	735.4
G_95_35	core	805	59	111	1490	11.1	2960.00	45.10	2.72	14.00	17.30	8.70	55.40	30.60	4.58	77.00	21.60	237.00	84.30	400.00	98.70	1004.00	208.80	12770	1371	150	2490	1.0	750.1
G_95_17	core	815	60	119	2500	12.3	2830.00	38.30	1.42	31.00	75.00	10.20	50.00	20.40	1.85	48.10	16.80	207.00	84.80	427.00	107.60	1110.00	228.00	13970	1362	287	2590	1.1	759.4
G_95_5	rim	857	61	360	1.92E+06	83	673000.00	15.90	14010.00	1800000.00	3860000.00	474000.00	1890000.00	364000.00	1454.00	272000.00	34200.00	154000.00	23100.00	41700.00	3570.00	13130.00	1193.00	10.6	3.22E+04	1.29E+06	5.68E+04	1.9	968.6
G_95_34	core	900	69	Below LOD	1630	13.8	4420.00	67.50	1.56	17.50	63.50	10.99	68.60	44.20	5.88	117.30	33.50	351.00	121.30	531.00	121.60	1143.00	216.00	16450	1638	148	2950	1.1	769.9
G_95_40	rim	909	65	Below LOD	1030	8.3	2120.00	38.70	0.78	3.40	14.57	2.35	15.40	9.90	1.40	36.50	13.53	174.10	67.50	338.00	82.80	845.00	171.30	13900	1259	240	1976	0.9	724.7
G_95_8	rim	923	66	Below LOD	2170	9.6	5090.00	63.20	1.74	3.60	34.60	1.97	13.30	12.90	1.28	72.40	29.60	392.00	158.20	733.00	159.50	1436.00	271.80	11310	2149	745	3325	1.0	737.2
G_95_2	rim	931	67	89	1770	11.2	2820.00	31.60	0.96	3.32	98.00	2.21	13.40	11.70	1.16	50.50	18.49	227.60	90.10	410.00	96.90	977.00	193.70	11310	1313	571	2124	1.0	750.9
G_95_9	rim	944	67	30	1790	11.4	4920.00	43.10	2.76	14.40	57.80	9.62	61.20	40.80	6.12	124.70	37.20	396.00	143.30	613.00	127.30	1139.00	213.00	11010	1555	685	2410	1.1	752.5
G_95_14	rim	955	72	37	920	13	2710.00	44.80	0.85	6.36	19.40	5.82	37.70	23.30	3.67	63.40	19.80	218.00	79.80	352.00	81.10	758.00	140.40	13730	1543	245	2478	1.1	764.4
G_95_18	rim	968	69	Below LOD	578	12.7	1392.00	18.40	0.30	1.08	22.50	0.81	6.69	9.51	0.53	48.30	16.48	154.40	43.60	154.20	27.20	215.30	34.90	13680	659	119.4	1042	1.1	762.3
G_95_36	rim	973.5	68	Below LOD	771	9.8	1436.00	20.45	Below LOD	Below LOD	18.77	0.08	1.71	6.11	0.09	41.50	15.75	164.60	46.80	157.20	26.30	193.80	30.76	14100	486	92.6	715	1.0	739.0
G_95_20	rim	985	69	Below LOD	588	11.9	1306.00	15.99	0.09	0.68	23.71	0.53	5.40	8.25	0.37	47.70	16.29	151.40	41.20	137.30	21.96	164.80	26.00	13730	541	107.4	827	1.1	756.3
G_95_39	rim	996	73	508	660	11.9	1380.00	23.10	1.73	2.37	12.60	1.74	11.30	7.83	1.01	26.90	9.11	112.00	42.90	210.00	53.20	562.00	120.80	13050	1135	152	1690	1.1	756.3
G_95_22	core	1000	70	Below LOD	481	10.1	1311.00	16.71	Below LOD	0.45	25.21	0.30	3.33	6.83	0.23	35.80	12.79	131.80	40.90	153.30	28.70	242.00	41.20	14000	850	99.7	1265	1.0	741.7
G_95_32	core	1003	71	Below LOD	1320	8.7	3330.00	24.70	1.11	14.30	32.30	8.43	56.40	37.40	5.21	112.30	29.90	280.00	85.00	319.60	60.00	468.70	74.90	13170	1030	109.4	1474	0.9	728.7
G_95_12	core	1012	71	214	1030	14.2	2360.00	37.70	1.17	1.72	11.16	1.29	8.40	7.39	0.79	31.80	13.36	177.50	68.10	309.00	67.80	628.00	118.00	13030	1272	100.7	1785	1.2	772.6
G_95_4	core	1019	71	114	1100	9.7	2530.00	46.60	1.17	4.05	20.80	2.67	18.40	13.60	1.90	49.90	17.90	215.00	78.50	354.00	80.10	738.00	141.90	13270	1664	298	2399	1.0	738.2
G_95_1	core	1028	72	104	984	12.1	2388.00	50.70	0.67	2.52	17.30	1.49	9.50	7.50	0.89	29.40	12.20	170.90	70.30	351.30	84.30	820.00	161.70	14160	1476	83.3	2091	1.1	757.9
G_95_10	core	1035	75	133	536	13.3	1312.00	17.17	0.98	0.21	20.91	0.13	2.07	6.55	0.15	43.70	15.37	148.30	41.60	139.50	23.83	180.20	29.00	13670	564	99.4	800	1.1	766.5
G_95_25	core	1037	72	43	1150	14.7	2900.00	82.20	1.13	11.10	18.92	6.72	41.90	26.80	3.75	69.90	20.80	220.60	78.50	345.00	72.20	638.00	114.40	14150	1950	127.1	2794	1.2	775.9
G_95_27	rim	1038	73	65	1230	10.1	2680.00	48.90	0.72	7.70	28.90	4.91	31.10	19.50	2.67	61.40	19.50	219.00	79.20	339.00	72.50	647.00	120.00	13660	1629	213	2296	1.0	741.7
G_95_13	rim	1061	74	Below LOD	329	11.1	957.00	39.90	0.10	0.63	4.66	0.46	3.22	2.30	0.31	11.90	5.09	69.10	26.50	119.90	27.90	276.00	54.90	14230	1813	51.4	2528	1.0	750.1
G_95_26	core	1063	74	Below LOD	920	11.9	2120.00	56.10	0.26	0.30	15.12	0.17	1.62	3.74	0.16	26.00	11.49	154.50	66.00	335.00	85.80	880.00	172.10	13420	1027	89	1387	1.1	756.3
G_95_23	rim	1101	77	Below LOD	671	10.3	1391.00	32.50	Below LOD	Below LOD	9.30	Below LOD	Below LOD	Below LOD	Below LOD	17.10	7.49	102.70	43.00	226.20	61.10	701.00	147.60	15370	1314	63.8	1758	1.0	743.4
G_95_16	core	1103	77	46	715	15.1	1739.00	28.10	0.62	4.40	15.60	2.55	15.20	10.60	1.39	32.90	11.40	139.90	55.30	264.60	64.30	661.00	128.50	14400	1364	252	1854	1.2	778.4
G_95_37	core	1110	81	Below LOD	851	9.3	2010.00	26.10	0.11	0.68	22.30	0.44	4.23	6.10	0.62	34.30	12.90	169.00	68.30	325.00	77.60	754.00	145.10	12610	1213	286	1610	1.0	734.5
G_95_11	core	1119	77	Below LOD	675	10.1	1895.00	8.89	0.29	Below LOD	68.20	0.30	5.54	11.10	2.82	52.80	16.83	180.60	62.70	265.60	54.10	470.00	88.30	9780	435	304	551	1.0	741.7
G_95_31	core	1145	81	Below LOD	1620	11.2	3840.00	58.00	0.21	2.63	10.74	1.47	9.30	8.44	0.86	41.40	17.97	256.20	111.70	572.00	136.60	1293.00	241.60	13290	1152	78.6	1456	1.0	750.9
G_95_7	rim	1148	82	Below LOD	1600	18.2	5210.00	53.90	0.75	2.66	66.20	1.88	13.70	15.70	1.52	92.10	35.00	427.00	160.50	713.00	147.20	1298.00	233.20	10710	2496	1321	3066	1.3	796.3
G_95_38	core	1226	89	Below LOD	1940	11.8	4410.00	32.60	0.28	1.32	57.20	0.82	7.20	13.29	1.25	77.90	29.50	361.00	141.00	637.00	139.50	1244.00	229.80	12380	1916	875	2274	1.1	755.6
G_95_19	core	1278	88	Below LOD	930	9.7	1880.00	29.70	0.22	2.50	21.90	1.99	14.10	8.40	1.43	34.40	12.40	149.00	58.10	288.00	63.90	617.00	121.90	12030	1131	183	1220	1.0	738.2

TABLE A3. Lu, Hf and Yb ISOTOPIC DATA OBTAINED USING THE LA-ICP-MS METHOD

Spot	Session #	Duration (s)	N ratios	Total Hf beam (V)	Age (Ma) 206/238	2 σ	Conc (%)	$^{176}\text{Hf}/^{177}\text{Hf}$ f	2 σ	$^{176}\text{Lu}/^{177}\text{Hf}$ f	2 σ	$^{176}\text{Yb}/^{177}\text{Hf}$ f	2 σ	$^{178}\text{Hf}/^{177}\text{Hf}$ f	2 σ	Hf Fract (β_{Hf})	2 σ	Yb Fract (β_{Yb})	2 σ	$^{176}\text{Lu}/^{177}\text{Hf}$ CORR	$\epsilon\text{Hf}_{(0)}$	$^{176}\text{Hf}/^{177}\text{Hf}_{(t)}$	2 σ	$^{176}\text{Hf}/^{177}\text{Hf}$ (CHUR T=t)	$\epsilon\text{Hf}_{(t)}$	2 σ	$^{176}\text{Hf}/^{177}\text{Hf}_{(\text{CC T=0})}$	$T_{\text{DM1}}(\text{y})$ $^{176}\text{Hf}/^{177}\text{Hf}$	$T_{\text{DM1}}(\text{y})$ $^{176}\text{Hf}/^{177}\text{Hf}$ (CC T=0)	(Ma)	$T_{\text{DM2}}(\text{y})$ $^{176}\text{Hf}/^{177}\text{Hf}$ (CC T=0)	(Ma)	$T_{\text{DM2}}(\text{Griffin et al.2000})$	(Ma)	U-S (Ga)	$f_{\text{(sample)}}$
G52a - 1	2	36.072	72	32.4	168.4	13	56.5	0.282759861	0.000026	0.001071	0.000024	0.053	0.0015	1.46721	0.000027	-1.5318	0.0025	-1.261	0.01	0.000149134	-0.888968651	0.282759392	0.000032	0.282679194	2.8	1.1	0.282806626	674957150.3	610924074	610.9240738	988631453.4	988.6	992132020.5	992.1	3.5005671	-0.995561492
G52a - 2	2	36.254	73	37.9	172.7	13	86.1	0.282770861	0.000014	0.0002881	0.0000098	0.01291	0.00039	1.467193	0.000031	-1.5405	0.0021	-1.208	0.018	4.01172E-05	-0.5	0.282770731	0.000023	0.282676488	3.3	0.8	0.282819174	658058319	592069525	592.0695248	960902433.9	960.9	964224488.9	964.2	3.322055001	-0.998806037
G52a - 3	2	14.501	29	46.8	65.5	7.6	62.0	0.282735863	0.000033	0.0004532	0.0000079	0.01706	0.00067	1.46723	0.000052	-1.5465	0.0041	-1.282	0.021	6.31069E-05	-1.737627526	0.282735785	0.000038	0.282743886	-0.3	1.3	0.28275414	706226309.6	681279373	681.2793734	1104466739	1104.5	1108850643	1108.9	4.38390378	-0.998121819
G52a - 4	2	36.072	72	38.7	164.7	12	100.0	0.282774861	0.000014	0.000332	0.00001	0.01272	0.00047	1.467199	0.000024	-1.5358	0.0023	-1.257	0.022	4.62301E-05	-0.358556854	0.282774718	0.000023	0.282681523	3.3	0.8	0.282820913	652700567.8	589784584	589.784584	957057120	957.1	960351831.6	960.4	3.294711655	-0.998624104
G52a - 5	2	36.072	72	42.9	217	18	7.1	0.282762861	0.000016	0.0004078	0.0000064	0.01763	0.00023	1.467217	0.000025	-1.5384	0.0025	-1.271	0.015	5.67851E-05	-0.782886292	0.282762631	0.000024	0.282648597	4.0	0.9	0.282823525	669262795.2	586373662	586.373662	951284054.8	951.3	954537713.5	954.5	3.253658745	-0.998309969
G52a - 6	2	36.216	72	32.3	133.6	10	30.2	0.282734863	0.000022	0.001158	0.000019	0.07911	0.00073	1.467184	0.000027	-1.5317	0.0032	-1.2567	0.0071	0.000220011	-1.772988313	0.282734313	0.000029	0.282701087	1.2	1.0	0.282771774	710449574.7	659854901	659.8549011	1065575748	1065.6	1069629959	1069.6	4.054210256	-0.993452061
G52a - 7	2	36.19	72	37.7	189.1	15	36.2	0.282814859	0.000018	0.000744	0.000054	0.0385	0.0028	1.467208	0.000026	-1.541	0.0022	-1.216	0.0094	0.0001036	1.055874664	0.282814492	0.000026	0.282666166	5.2	0.9	0.282867543	598942476.8	526781022	526.7810218	853875966.8	853.9	856492702.3	856.5	2.616735535	-0.996916667
G52a - 8	2	36.151	72	38.1	189.7	15	44.7	0.28278086	0.000018	0.0004355	0.000009	0.0228	0.00067	1.467183	0.000022	-1.5401	0.0023	-1.2	0.011	6.06422E-05	-0.146392135	0.282780645	0.000026	0.282665788	4.1	0.9	0.282833865	644746485.3	572289197	572.2891973	928418613.2	928.4	931517358.9	931.5	3.098745672	-0.998195172
G52a - 10	2	36.084	72	37.4	171	13	97.2	0.282701864	0.000016	0.000814	0.000002	0.0298	0.00011	1.467174	0.000024	-1.5475	0.0021	-1.272	0.012	0.000113347	-2.939894266	0.282701502	0.000024	0.282677558	0.8	0.9	0.282749467	753570749.9	688545971	688.5459707	1114767578	1114.8	1119224214	1119.2	4.456635875	-0.996626568
G52a - 11	2	36.175	72	37.1	170.9	13	79.1	0.282759861	0.000016	0.000658	0.000011	0.02579	0.00041	1.467196	0.000023	-1.5482	0.0022	-1.259	0.012	9.16247E-05	-0.888968651	0.282759568	0.000024	0.282677621	2.9	0.9	0.282807505	673960647.2	608818828	608.8188285	986689074.9	986.7	990184249.4	990.2	3.495174493	-0.997273073
G52a - 12	2	36.174	72	45.3	129.5	10	37.6	0.282697864	0.000018	0.000759	0.000056	0.0434	0.0034	1.467188	0.000023	-1.5434	0.0024	-1.2488	0.0099	0.000105689	-3.081337412	0.282697609	0.000026	0.282703665	-0.2	0.9	0.282733919	758881676.2	709653411	709.6534112	1149026456	1149.0	1153762524	1153.8	4.736067926	-0.996854503
G52a - 13	2	36.17	72	29.81	160.1	12	65.1	0.282673866	0.000018	0.0007242	0.0000096	0.0244	0.00027	1.467207	0.000029	-1.5286	0.0023	-1.26	0.015	0.000100843	-3.929966287	0.282673564	0.000026	0.282684417	-0.4	0.9	0.282718467	791525800.9	7306661364	730.6661364	1183052535	1183.1	1188074001	1188.1	5.021465112	-0.996998723
G52a - 14	2	36.17	72	26.3	158.5	12	87.7	0.282754862	0.000027	0.001758	0.000017	0.07043	0.00089	1.467225	0.000025	-1.5356	0.0025	-1.257	0.01	0.000244797	-1.065772583	0.282754136	0.000033	0.282685424	2.4	1.2	0.28279859	683479465.2	623467806	623.4678057	1006384038	1006.4	1009996875	1010.0	3.612836448	-0.992714382
G52a - 16	2	36.206	72	45.2	178.4	14	49.7	0.282747862	0.000018	0.0002422	0.0000039	0.0123	0.00034	1.467218	0.000025	-1.5504	0.002	-1.198	0.02	3.37257E-05	-1.313298089	0.282747349	0.000026	0.282672901	2.6	0.9	0.282797794	689329962.4	621180109	621.180109	10084142381	1008.1	1011799825	1011.8	3.657443637	-0.998996259
G52a - 17	2	36.172	72	26.5	169.8	13	93.4	0.282637867	0.000021	0.001644	0.000044	0.0549	0.0018	1.467223	0.000026	-1.5468	0.0022	-1.2925	0.009	0.000228923	-5.2029846	0.282637141	0.000028	0.282678313	-1.5	1.0	0.282684768	843365466.1	779215199	779.215196	1257182546	1257.2	1268221512	1262.8	5.639607412	-0.993168828
G52a - 18	2	36.152	72	30.9	164.2	12	81.6	0.282739862	0.000012	0.0003112	0.0000066	0.01172	0.00024	1.467185	0.000024	-1.5521	0.0021	-1.212	0.019	4.33338E-05	-1.596718438	0.282739729	0.000022	0.282681837	2.0	0.8	0.282785784	700412719.1	637736566	637.736566	1043659399	1043.7	1038510117	1038.5	6.907717481	-0.9979710305
G52a - 19	2	26.465	53	19.1	170.2	13	81.7	0.282645867	0.000023	0.00101	0.000033	0.0325	0.0013	1.467259	0.000043	-1.5708	0.0056	-1.29	0.011	0.00014064	-4.920098308	0.282645436	0.000029	0.282678062	-1.2	1.1	0.28269316	830542940.7	765989022	765.9890218	1238732988	1238.7	1244228967	1244.2	5.495708703	-0.995814292
G52a - 20	2	26.058	72	39.5	173.1	14	37.4	0.282638662	0.000016	0.0004879	0.0000046	0.02195	0.00023	1.467176	0.000024	-1.5507	0.0024	-1.251	0.015	6.79388E-05	-1.70226674	0.282736643	0.000024	0.282676237	2.1	0.9	0.282785198	704949119.2	638940623	638.9406232	1035953859	1036.0	1039810284	1039.8	3.856424593	-0.997978013
G52a - 21	2	34.985	70	35.7	192.2	14	30.6	0.282754862	0.000017	0.0004662	0.000012	0.02365	0.00086	1.4672	0.000027	-1.5463	0.0021	-1.233	0.011	6.43323E-05	-1.065772583	0.28275463	0.000025	0.282664214	3.2	0.9	0.282808553	680315358.6	606960719	606.9607189	984375497.7	984.4	9878582293	987.9	3.842732044	-0.998085349
G52a - 22	2	36.797	74	37.7	173.7	13	90.0	0.282733863	0.000017	0.000539	0.00001	0.02136	0.00036	1.467183	0.000029	-1.5391	0.0026	-1.255	0.011	7.50543E-05	-1.808349099	0.282733619	0.000025	0.282675859	2.0	0.9	0.282782342	709172584.2	642959412	642.959412	1042555920	1042.3	1046158223	1046.2	3.902303531	-0.997766241
G52a - 23	2	36.072	72	32.04	177.5	13	80.1	0.282716863	0.000018	0.000589	0.000026	0.02019	0.00088	1.46719	0.000028	-1.5399	0.0022	-1.288	0.018	8.20167E-05	-2.409487258	0.282716591	0.000026	0.282673467	1.5	0.9	0.282766383	732501240.6	664885108	664.8851079	1074769950	1077.5	1081638987	1081.6	4.169036682	-0.997559028
G52a - 24	2	36.17	72	24.42	175.1	13	84.5	0.282709864	0.000016	0.000907	0.000011	0.03051	0.00045	1.467173	0.00003	-1.5409	0.0024	-1.267	0.014	0.000126297	-2.657007974	0.28270945	0.000024	0.282674987	1.2	0.9	0.282758567	742895843.5	676330866	676.330866	10947052097	10947.0	1099000681	1099.0	4.296479555	-0.996241151
G52a - 25	2	36.152	72	24.73	192.6	14	50.8	0.282637867	0.000019	0.001335	0.000022	0.0445	0.00094	1.467176	0.000029	-1.5372	0.0025	-1.291	0.011	0.000185895	-5.2029846	0.282637198	0.000026	0.282663962	-0.9	1.0	0.282691232	842433061.7	769155575	769.1555754	1242970911	1243.0	1248493792	1248.5	5.522880515	-0.994467406
G52a - 26	2	36.164	72	38.7	173.3	13	69.7	0.282760861	0.000013	0.0003643	0.0000067	0.01546	0.00014	1.467172	0.000023	-1.5434	0.0021	-1.213	0.018	5.07278E-05	-0.853607865	0.282760697	0.000022	0.282676111	3.0	0.8	0.282809308	71888833.5	605716235	605.716235	982706112.5	982.7	986190244	986.2	3.472900278	-0.998490244
G52a - 27	2	31.722	63	28.4	189.1																															

G55b - 52	2	36.193	72	22.29	254.7	19	97.7	0.28258987	0.000017	0.000761	0.000024	0.0265	0.0011	1.467165	0.000036	-1.5326	0.0023	-1.29	0.016	0.000105967	-6.90030235	0.282589365	0.000025	0.282624843	-1.3	0.9	0.2826608763	906072120.6	809361184	809.3611839	1309707306	1309.7	1315899008	1315.9	6.151702209	-0.996846214
G55b - 53	2	34.523	69	16.69	255.8	19	98.0	0.282480875	0.000025	0.000083	0.000014	0.02968	0.00064	1.46717	0.00004	-1.5272	0.0036	-1.282	0.021	0.000115575	-10.75462807	0.282480322	0.000031	0.28262415	-5.1	1.1	0.28255213	1054470280	957.647745	957.6477449	1547969503	1548.0	1565656651	1556.6	8.587148562	-0.99656026
G55b - 54	2	36.175	72	14.37	2015	22	94.4	0.281533923	0.000025	0.0007588	0.0000086	0.02772	0.00025	1.467208	0.000038	-1.5276	0.0033	-1.303	0.024	0.000105661	-44.24129285	0.281529872	0.000031	0.281496889	1.2	1.2	0.282104922	2324278147	1562051425	1562.051425	2516923712	2516.9	2539601578	2539.6	22.67786632	-0.996855332
G52d - 1	2	36.183	72	16.01	233.2	5.7	100.0	0.28259187	0.00002	0.0000528	0.0000011	0.001954	0.00003	1.467189	0.000039	-1.5246	0.0036	-1.29	0.021	7.35226E-06	-6.829580777	0.282591838	0.000027	0.282638392	-1.6	1.0	0.282657288	901072942.7	812182022	812.1820219	1317559325	1317.6	1323810403	1323.8	6.251078012	-0.999781183
G52d - 2	2	33.047	66	18.12	228.8	5.4	100.1	0.282619868	0.000016	0.0000116	0.0000029	0.00046	0.00001	1.467185	0.000033	-1.5317	0.0028	-1.46	0.95	0.282614164	-0.829478756	0.282619861	0.000024	0.282641164	-0.8	0.9	0.282684074	862919479.2	775628004	775.6280037	1258709445	1258.7	1264416398	1264.4	5.706953117	-0.99951927
G52d - 3	2	30.152	60	16.02	235.5	5.5	100.3	0.28258187	0.000027	0.00001723	0.00000043	0.000665	0.000017	1.467188	0.000044	-1.533	0.0031	-1.38	0.82	0.239923E-06	-7.183188642	0.28258186	0.000033	0.282636691	-1.9	1.2	0.282648069	914531652	824612791	824.6127908	1337797737	1337.8	1344423458	1344.2	6.445721063	-0.999928594
G52d - 4	2	19.298	39	17.69	236.1	5.1	99.5	0.282604869	0.00003	0.0001208	0.0000059	0.0043	0.00022	1.467172	0.000043	-1.5268	0.004	-1.44	0.13	1.68211E-05	-6.369890553	0.282640495	0.000035	0.282636565	-1.1	1.2	0.28267106	883634883.2	793640756	793.6407566	1203702807	1203.7	1293273457	1293.3	5.965249938	-0.999499373
G52d - 5	2	11.541	23	18.22	391.4	17	93.4	0.282164891	0.000032	0.000717	0.0000025	0.0264	0.00097	1.467191	0.000058	-1.5291	0.0044	-1.271	0.037	9.98403E-05	-21.9286366	0.282164159	0.000037	0.282538571	-13.3	1.3	0.282274172	1481145299	133821014	1333.821014	2152272432	2152.3	2168689824	2168.9	16.59649166	-0.997028562
G52d - 6	2	15.778	32	19.29	170.8	4.5	94.3	0.282454877	0.000024	0.0001776	0.0000029	0.00607	0.00012	1.467186	0.000045	-1.5213	0.0052	-1.237	0.08	2.47303E-05	-11.67400852	0.282454798	0.000030	0.282677684	-7.9	1.1	0.282502706	1087226098	1022445946	1022.445946	165910993	1655.9	1665782132	1665.8	9.862198931	-0.999263978
G52d - 1	3	36.161	72	14.11	225.1	4.9	99.4	0.282597652	0.000026	0.00013177	0.00000059	0.004683	0.000038	1.467216	0.000046	-1.4998	0.0032	-1.23	0.16	1.83486E-05	-6.625109536	0.282597575	0.000032	0.282643495	-1.6	1.1	0.282660746	893473191.2	807705261	807.705261	1309963870	1310.0	1316140356	1316.1	6.176485982	-0.99945391
G52d - 2	3	36.179	72	13.2	225.2	5.8	94.6	0.282639653	0.000026	0.0000787	0.0000023	0.002367	0.000052	1.467239	0.000037	-1.4799	0.0039	-1.41	0.34	1.09588E-05	-5.139852538	0.282639607	0.000032	0.282643432	-0.1	1.1	0.282702807	836236365.1	750312388	750.3123878	1217514947	1217.5	1222852722	1222.9	5.337774194	-0.999673846
G52d - 3	3	36.192	73	14.18	229.8	5.2	100.7	0.282648653	0.000026	0.0000811	0.0000021	0.002874	0.000075	1.467239	0.000037	-1.4942	0.0037	-1.26	0.26	1.1293E-05	-4.821583182	0.282648604	0.000032	0.282640534	0.3	1.1	0.282713098	824006634.3	736303502	736.3035021	1194869666	1194.9	1200010815	1200.0	5.141149358	-0.9996639
G52d - 4	3	36.056	72	14.08	240.6	6.1	96.2	0.282717654	0.000028	0.0000299	0.0000036	0.000914	0.000082	1.467226	0.000039	-1.4978	0.0035	-1.5	1.1	4.16349E-06	-2.381518114	0.282717635	0.000033	0.282633729	3.0	1.2	0.282785167	729964304.1	637938151	637.9381505	1036021221	1036.0	1039888260	1039.9	3.867039012	-0.999876086
G52d - 5	3	36.058	72	13.45	232.5	6.1	101.8	0.282651653	0.000028	0.0000944	0.0000061	0.00312	0.00016	1.467228	0.000044	-1.5022	0.0034	-1.23	0.31	1.31449E-05	-4.715493396	0.282651596	0.000033	0.282638833	0.5	1.2	0.282716849	819965904.7	731229258	731.2292576	1186614001	1186.6	1191684023	1191.7	5.00021913	-0.999608781
G52d - 6	3	36.054	72	14.33	233.3	5.8	96.5	0.282594652	0.000025	0.00001164	0.00000044	0.000443	0.000017	1.467227	0.000045	-1.4973	0.0037	-0.1	1.5	1.62084E-06	-6.731199321	0.282594645	0.000031	0.282638329	-1.5	1.1	0.282660123	897164164.3	808207642	808.2076425	1311333363	1311.3	1317527019	1317.5	6.193655792	-0.999951761
G52d - 7	3	36.182	72	13.11	233.4	6.5	100.2	0.282885658	0.000028	0.0000148	0.0000002	0.003746	0.000056	1.467204	0.000044	-1.5029	0.0036	-1.08	0.19	2.06086E-05	-3.559599875	0.282885568	0.000033	0.282638266	8.7	1.2	0.282951074	500878275.2	412917960	412.9179604	668543065.1	668.5	670155701.7	670.2	6.099552593	-0.999386649
G52d - 8	3	36.186	73	16	225	5.6	97.3	0.282675653	0.000022	0.0000577	0.0000018	0.002007	0.000063	1.467188	0.000038	-1.4902	0.0033	-1.33	0.3	8.03457E-06	-3.866775112	0.28267562	0.000029	0.282643558	1.1	1.0	0.282738763	787213567.4	701277156	701.277156	1138354362	1138.4	1143021674	1143.0	4.667311973	-0.999760876
G52d - 9	3	36.159	71	14.12	245.8	7.2	101.6	0.282724654	0.000028	0.00012141	0.00000089	0.003746	0.000025	1.467248	0.000039	-1.4992	0.0035	-1.3	0.2	1.6906E-05	-2.139758252	0.282724577	0.000033	0.282630452	3.3	1.2	0.282793571	720664938.4	62676279	626.762793	1017467109	1017.5	1021195015	1021.0	3.727906186	-0.999496845
G52d - 10	3	36.155	72	12.48	231.8	7.1	102.1	0.282800656	0.000022	0.0000323	0.0000041	0.001009	0.00008	1.467203	0.000048	-1.4987	0.0041	-1.3	0.84	4.49769E-06	-0.553632618	0.282800636	0.000029	0.282639274	5.7	1.0	0.282865693	161680456.7	527971840	527.9718399	85794578.3	858.0	860627279.9	860.6	2.652701532	-0.99986614
G52d - 11	3	36.158	72	12.93	254.1	6.7	92.1	0.282691654	0.000025	0.0000282	0.0000011	0.001109	0.00004	1.46722	0.00004	-1.4988	0.0041	-1.85	0.78	3.92677E-06	-3.300962922	0.282691635	0.000031	0.282652221	2.3	1.1	0.282762965	765358612.6	668215270	668.215270	1085091812	1085.0	1085248938	1089.2	4.241126205	-0.999883132
G52d - 12	3	36.192	72	13.22	234.3	6	96.8	0.282650653	0.000024	0.00001349	0.00000039	0.000601	0.000019	1.467253	0.000043	-1.5028	0.0037	-2.1	1.3	1.87845E-06	-4.750856658	0.282650645	0.000030	0.282637699	0.5	1.1	0.282716404	821089179.4	731624065	731.6240646	1187593038	1187.6	1192673776	1192.7	5.080738728	-0.999944094
G52d - 13	3	36.151	72	14.02	229.7	5.7	100.0	0.282611652	0.000019	0.00002532	0.00000075	0.000942	0.000031	1.467214	0.000042	-1.5018	0.0037	-1.61	0.67	3.52574E-06	-6.13027320.4	0.282611637	0.000026	0.282640597	-1.0	0.9	0.282761003	874122320.4	786511654	786.5116545	1276229297	1276.2	1282095618	1282.1	8.866321461	-0.999895067
G52d - 14	3	36.174	72	14.56	226.1	5.4	98.8	0.282657653	0.000024	0.0001038	0.0000074	0.0032	0.00017	1.467244	0.00004	-1.5073	0.0035	-1.26	0.22	1.45359E-05	-4.503313825	0.282657592	0.000030	0.282642865	0.5	1.1	0.282721045	811832616.3	725537259	725.5372589	1173776683	1177.4	1182367876	1182.4	4.991192337	-0.999569825
G52d - 15	3	36.068	73	13.84	234.7	5.4	101.2	0.282671653	0.000028	0.0002199	0.0000037	0.00706	0.00011	1.467224	0.00004	-1.5006	0.0038	-1.37	0.088	3.06250E-05	-4.008228159	0.282671519	0.000033	0.282637791	79.11	1.1	0.282737091	793114182	703554583	703.5454834	1141378262	1141.4	1146066014	1146.1	6.98752238	-0.999088676
G52d - 16	3	36.062	72	13.91	233	6.8	89.6	0.282663653	0.000025	0.00002176	0.00000073	0.000817	0.000035	1.467193	0.000038	-1.4979	0.0033	-2.3	1.1	3.03002E-06	-4.291134254	0.28266364	0.000031	0.282638518	0.9	1.1	0.282729034	803435746.5	714443361	714.443361	1159786129	1159.8	1164631686	1164.6	4.845557082	-0.999909821
G52d - 17	3	36.196	73	13.88	235.5	6	99.8	0.28266653	0.000028	0.0000311	0.0000019	0.001168	0.000038	1.467225	0.000044	-1.4992	0.0034	-1.43	0.66	4.33059E-06	-4.185044468	0.282666534	0.0													

G54 - 40	3	36.166	72	16.86	223.6	4.9	100.7	0.282437649	0.000021	0.0000699	0.00000074	0.003004	0.000061	1.467241	0.000038	-1.4915	0.0035	-1.4	0.21	9.73339E-06	-12.28323143	0.282437608	0.000028	0.28264444	-7.3	1.0	0.282500358	1110116328	1025235784	1025.235784	1661043996	1661.0	1670973363	1671.0	9.929367328	-0.999710316
G54 - 41	3	36.153	73	17.41	235.8	5.5	101.1	0.282445649	0.000022	0.0000729	0.00000019	0.003022	0.000092	1.467231	0.000037	-1.4907	0.0033	-1.23	0.18	1.01511E-05	-12.00032534	0.282445604	0.000029	0.282636754	-6.8	1.0	0.282511785	1099306873	1009764466	1009.764466	1636106179	1636.1	1645739810	1645.7	9.633631617	-0.996967883
G54 - 42	3	36.152	72	15.42	584.9	14	100.7	0.282339647	0.000026	0.0004877	0.00000042	0.01716	0.00011	1.46724	0.000044	-1.491	0.0033	-1.276	0.043	6.79109E-05	-15.74888107	0.282338901	0.000032	0.282416075	-2.7	1.1	0.2825036	1244343355	1022362846	1022.362846	1653970413	1654.0	1663791601	1663.8	9.821188136	-0.997978842
G54 - 43	3	36.154	72	12.35	307.5	6.5	99.2	0.282565651	0.000033	0.001178	0.00000005	0.0408	0.002	1.467194	0.000044	-1.4876	0.0037	-1.305	0.029	0.000164033	-7.75673914	0.282564707	0.000038	0.282591547	-0.9	1.4	0.28265107	940422964.2	823939743	823.939743	1331210805	1331.2	1337550583	1337.6	6.33977431	-0.995118056
G54 - 44	3	36.171	73	14.93	1184	27	99.3	0.282246645	0.00003	0.001347	0.00000033	0.0498	0.001	1.467221	0.000041	-1.4937	0.0033	-1.279	0.018	0.000187566	-19.03761444	0.282242452	0.000035	0.282033993	-7.4	1.4	0.282577724	1370442474	924533751	924.533751	1491982826	1492.0	1499936167	1499.9	7.953341611	-0.994417675
G54 - 45	3	36.151	72	16.97	248.7	14	96.4	0.282423648	0.000026	0.000351	0.00000019	0.01092	0.00054	1.46717	0.00004	-1.4841	0.0034	-1.245	0.056	4.88758E-05	-12.7783171	0.282423624	0.000032	0.282628625	-7.3	1.1	0.282493231	1310176622	1035924258	1035.924258	1657690651	1657.6	1686690162	1686.7	10.09951079	-0.998545363
G54 - 46	3	36.154	72	17.13	619.5	14	99.9	0.282352647	0.000027	0.000423	0.00000067	0.0161	0.0023	1.467229	0.00004	-1.4928	0.003	-1.344	0.064	5.89016E-05	-15.28910869	0.282351962	0.000033	0.282394124	-1.5	1.2	0.28252646	1226493461	991110489	991.110489	1640065167	1640.1	1613306711	1613.3	9.241543651	-0.998246976
G54 - 47	3	36.193	72	14.18	302.5	21	96.7	0.282384648	0.000031	0.001116	0.00000027	0.0414	0.0011	1.467225	0.000038	-1.4892	0.0037	-1.301	0.019	0.0001554	-14.15748431	0.282383767	0.000036	0.282594701	-7.5	1.3	0.28267262	1186156952	1072059272	1072.059272	1730.0	1740276776	1740.2	10.0550181	-0.995375	
G54 - 48	3	36.154	72	16.64	212	5.5	100.6	0.28248165	0.000026	0.0002324	0.00000038	0.00818	0.00012	1.467228	0.000037	-1.4784	0.0037	-1.263	0.087	3.23611E-05	-10.72724791	0.282481521	0.000032	0.282651746	-6.0	1.1	0.282541009	1051180020	970701026	970.701026	1572278071	1572.3	1581167382	1581.2	8.889311357	-0.999036873
G54 - 49	3	32.974	66	12.04	234.7	8.7	100.3	0.282346647	0.000035	0.001122	0.00000015	0.04588	0.00047	1.467302	0.000052	-1.5002	0.0039	-1.315	0.026	0.000169882	-15.50128826	0.282345901	0.000039	0.282637447	-10.3	1.4	0.282411773	1238106764	1149798250	1149.79825	1853969457	1854.0	1866253737	1866.3	12.28428017	-0.994943996
G54 - 50	3	36.192	72	17.57	443.8	14	97.8	0.282402648	0.000022	0.000098	0.00000019	0.00384	0.00073	1.467259	0.000039	-1.4934	0.0028	-1.28	0.24	1.36462E-05	-13.52094559	0.282402534	0.000029	0.282505442	-3.6	1.0	0.282527337	1157548782	988775725	988.775725	1602149601	1602.1	1611386488	1611.4	9.236886587	-0.999593862
G54 - 51	3	36.153	72	16.75	237.4	5.3	98.0	0.282537651	0.000021	0.000607	0.00000004	0.0194	0.0011	1.467257	0.000036	-1.4901	0.0031	-1.31	0.037	8.45231E-05	-8.746905246	0.282537275	0.000028	0.282635746	-3.5	1.0	0.282603907	976560112.6	886477082	886.477082	1434646124	1434.6	1442032749	1442.0	7.386625098	-0.997484431
G54 - 52	3	36.074	73	16.56	276.9	6.5	101.1	0.282629652	0.00003	0.001284	0.00000074	0.0416	0.0022	1.467218	0.000034	-1.496	0.0034	-1.302	0.018	0.000178794	-5.493485157	0.282628726	0.000035	0.282610848	-0.6	1.3	0.282706472	853493309.4	748536933	748.536933	1209449713	1209.4	1214680476	1214.7	5.23076284	-0.994678763
G54 - 53	3	36.151	72	16.11	399	9.8	97.8	0.28251765	0.000028	0.001237	0.00000028	0.0442	0.0011	1.467232	0.000039	-1.4948	0.0036	-1.273	0.019	0.000172249	-9.454170483	0.282516362	0.000033	0.282533768	-0.6	1.2	0.282628519	1005981581	854896020	854.896019	1380691653	1380.7	1387508602	1387.5	6.816949261	-0.994873544
G54 - 54	3	36.17	72	18.89	372.9	8.1	97.1	0.282392648	0.000025	0.00049	0.00000014	0.0177	0.00045	1.467248	0.000038	-1.4942	0.0033	-1.334	0.032	6.82312E-05	-13.87457821	0.282392171	0.000031	0.282550259	-5.6	1.1	0.282496966	1172694017	1031370882	1031.370882	1668443900	1668.4	1678437520	1678.4	9.993620046	-0.99796931
G54 - 55	3	36.155	73	12.56	991	27	98.5	0.282282646	0.000029	0.0006	0.00000021	0.02324	0.00069	1.467215	0.000047	-1.4925	0.0038	-1.328	0.049	8.35484E-05	-17.76453702	0.282281085	0.000034	0.282157541	-4.4	1.3	0.282561198	1231830799	944538097	944.538095	1528139376	1528.1	1536518859	1536.5	8.37947808	-0.997513441
G54 - 56	3	36.155	72	15.78	300.1	8.9	98.0	0.282339647	0.000026	0.00085	0.00000007	0.03081	0.00064	1.467221	0.000042	-1.4881	0.0029	-1.276	0.025	0.00011836	-15.744597520	0.282339621	0.000032	0.282596215	-9.1	1.1	0.282424321	1245947520	1132711231	1132.711231	1828989904	1829.0	1840971569	1841.0	11.98166404	-0.998477375
G54 - 57	3	36.152	72	14.82	1069.3	21	96.0	0.282175643	0.000025	0.001143	0.00000046	0.0428	0.0016	1.467276	0.000038	-1.4931	0.0039	-1.283	0.021	0.00015916	-21.54840601	0.282174344	0.000031	0.282107475	-3.2	1.2	0.282474901	1468888692	1063767442	1063.767442	1716557477	1716.6	1727094621	1727.1	10.53714421	-0.995263105
G54 - 58	3	36.151	72	18.44	234.1	5.4	99.4	0.282613652	0.000019	0.0001213	0.00000002	0.00841	0.00017	1.467247	0.000037	-1.4919	0.003	-1.11	0.58	1.68907E-06	-6.059297346	0.282613634	0.000026	0.282637825	-0.9	0.9	0.282679348	871364803.9	7820593051	782.059305	1269097112	1269.1	1274898543	1274.9	5.801430911	-0.99849776
G54 - 59a	3	14.583	29	17.65	235.9	6.5	94.4	0.282419648	0.000038	0.000362	0.00000016	0.01372	0.00051	1.46721	0.000087	-1.4924	0.0046	-1.28	0.065	5.04075E-05	-12.91977014	0.282419426	0.000042	0.282636691	-7.7	1.5	0.282485635	1135634241	104626315	1046.26315	1693156065	1693.2	1703455244	1703.5	10.29917912	-0.998499776
G54 - 59b	3	20.952	42	15.65	235.9	6.5	94.4	0.282256645	0.000025	0.0004628	0.00000077	0.01677	0.00025	1.46719	0.000053	-1.4989	0.0044	-1.341	0.005	6.44437E-05	-18.68398182	0.282256361	0.000031	0.282636691	-13.5	1.1	0.28232257	1356251783	1267928909	1267.928909	2062539945	2062.5	2062539945	2062.6	15.04513047	-0.998082034
G54 - 60	3	36.154	72	13.53	952	23	94.4	0.282196644	0.000028	0.000578	0.00000016	0.02144	0.00066	1.467252	0.000042	-1.4921	0.0039	-1.298	0.034	0.04849E-05	-20.80577753	0.282195201	0.000033	0.28218246	-0.5	1.2	0.282461492	1437670846	1076148785	1076.148785	1739893119	1739.9	1750753986	1750.8	10.86068711	-0.997604615
G54 - 61	3	36.159	72	13.02	395.8	9.1	94.5	0.282405648	0.000035	0.000859	0.00000001	0.03145	0.00029	1.467235	0.000043	-1.4891	0.0038	-1.294	0.029	0.000119613	-13.41485581	0.282404761	0.000039	0.28253579	-4.6	1.4	0.282516015	1156620471	1006847421	1006.847421	1626872592	1626.9	1636354688	1636.4	9.482096464	-0.996440076
G54 - 62	3	36.152	72	16.74	211.4	5.1	95.9	0.282462649	0.000022	0.000182	0.00000011	0.00618	0.00029	1.467218	0.00004	-1.4925	0.0033	-1.286	0.097	2.5343E-05	-11.39914988	0.282462549	0.000029	0.282651218	-6.7	1.0	0.282521868	1076721862	996486465	996.486448	1614093228	1614.1	1623462896	1623.5	9.370568226	-0.999245674
G54 - 63	3	25.074	50	15.52	938	67	95.6	0.28198064	0.000033	0.000474	0.00000013	0.01545	0.00051	1.46722	0.000044	-1.4975	0.0042	-1.268	0.06	6.60032E-05	-28.44424209	0.281979473	0.000038	0.2826191399	-7.5	1.4	0.282244472	1727139712	1372712640	1372.71264	2214636600	2214.6	2234060208	2234.1	17.62366088	-0.998035618
G54 - 64	3	36.162	72	14.54	210.1	4.6	101.4	0.282474649	0.000025	0.0001624	0.00000035	0.005482	0.00087	1.467168	0.000046	-1.4693	0.0043	-1.22	0.12	2.26138E-05	-10.97479074	0.282474561	0.000031	0.282652943	-6.3	1.1	0.282533515	1060398713	980624786	980.624786	1588654838	1588				

MT - 27	3	36.085	72	15.17	570	2	100	0.28251165	0.000023	0.00003623	0.00000017	0.001593	0.000015	1.467215	0.000044	-1.5037	0.0037	-1.68	0.4	5.04493E-06	-9.666350054	0.282511596	0.000029	0.282425523	3.0	1.0	0.282672077	1009816054	792018754	792.0187539	1285074732	1285.1	1291021993	1291.0	-7.418499479	-0.999849853
MT - 28	3	36.152	72	15.54	570	2	100	0.28251765	0.000024	0.00001798	0.00000021	0.000752	0.000015	1.467226	0.000038	-1.5045	0.0039	-1.14	0.96	2.50367E-06	-9.454170483	0.282517623	0.000030	0.282425523	3.3	1.1	0.282678104	1001621148	783767762	783.7677622	1271830216	1271.8	1277656232	1277.7	36.86276661	-0.999925486
MT - 29	3	36.184	72	15.29	570	2	100	0.28250365	0.000025	0.00001564	0.00000018	0.000651	0.000014	1.467226	0.000043	-1.5023	0.0038	-1.1	1.1	2.17783E-06	-9.949256149	0.282503627	0.000031	0.282425523	2.8	1.1	0.282664108	1020579297	802800255	802.8002552	1302581997	1302.6	1308692983	1308.7	8.313023028	-0.999935184
MT - 30	3	36.151	73	15.37	570	2	100	0.28250265	0.000025	0.00001105	0.00000019	0.000474	0.000014	1.467244	0.000045	-1.501	0.0037	-1.9	1.4	1.53868E-06	-9.984619411	0.282502633	0.000031	0.282425523	2.7	1.1	0.282663114	1021917114	804.137818	804.1378177	1511499007	1511.5	1310895020	1310.9	-1304.763405	-0.999954206
Plesovice - 1	1	36.135	72	22.06	338	1	100	0.282484	0.000015	0.00013581	0.00000033	0.006869	0.000063	1.46714	0.00003	-1.5183	0.0029	-1.253	0.046	1.89112E-05	-10.64412893	0.28248388	0.000024	0.282572298	-3.1	0.8	0.282578836	1047635654	919036582	919.0365819	1489547111	1489.5	1497530851	1497.5	7.983739744	-0.999437167
Plesovice - 2	1	22.109	44	21.5	338	1	100	0.282482	0.000023	0.00010276	0.00000017	0.005186	0.000018	1.467213	0.000041	-1.5164	0.0035	-1.2	0.084	1.43091E-05	-10.71485404	0.282481909	0.000029	0.282572298	-3.2	1.0	0.282576866	1050220934	921603807	921.6038075	1493860721	1493.9	1501892243	1501.9	8.031522597	-0.999574135
Plesovice - 3	1	36.177	72	22.29	338	1	100	0.282486	0.000018	0.0001086	0.00000027	0.009362	0.000095	1.467193	0.000028	-1.5124	0.0021	-1.279	0.043	0.0000259	-10.57340382	0.282485836	0.000026	0.282572298	-3.1	0.9	0.282580792	1045113338	916.545073	916.5450732	1485266227	1485.3	1493201902	1493.2	7.935674974	-0.999229167
Plesovice - 4	1	27.59	55	23.07	338	1	100	0.282479	0.000016	0.0001279	0.00000046	0.00632	0.000026	1.467186	0.000032	-1.5169	0.0032	-1.212	0.08	1.78097E-05	-10.82039417	0.282478887	0.000024	0.282572298	-3.3	0.9	0.282573843	1054377482	925788807	925.7888071	1500474608	1500.5	1508576166	1508.6	8.101551271	-0.999469948
Plesovice - 5	1	23.1	46	19.9	338	1	100	0.282474	0.00002	0.00017139	0.00000024	0.00894	0.000023	1.467185	0.000046	-1.5162	0.0032	-1.246	0.053	2.38656E-05	-10.99775448	0.282473849	0.000027	0.282572298	-3.5	1.0	0.282568805	1061312013	932771941	932.7719412	1511499007	1511.5	1519717861	1519.7	8.218854246	-0.999289714
Plesovice - 6	1	26.224	52	21.42	338	1	100	0.282483	0.000021	0.00010512	0.00000017	0.005255	0.000018	1.467188	0.000038	-1.5133	0.0033	-1.2	0.081	1.46377E-05	-10.76949149	0.282482907	0.000028	0.282572298	-3.2	1.0	0.282577864	1048875562	920256933	920.2569333	1491676631	1491.7	1499684602	1499.7	8.007971163	-0.999564355
Plesovice - 7	1	31.269	63	21.81	338	1	100	0.282479	0.000019	0.00010734	0.00000041	0.005416	0.000011	1.467173	0.000031	-1.5014	0.0031	-1.19	0.07	1.49468E-05	-10.8209417	0.282478905	0.000026	0.282572298	-3.3	0.9	0.282573862	1054300414	925696457	925.6964575	1500434948	1500.4	1508537029	1508.5	8.102080208	-0.999555155
Plesovice - 8	1	23.083	46	20.51	338	1	100	0.282487	0.000021	0.00012917	0.00000023	0.006635	0.000029	1.467187	0.000034	-1.4977	0.0032	-1.279	0.081	1.79866E-05	-10.53804127	0.282486886	0.000028	0.282572298	-3.0	1.0	0.282581842	1043547715	914939399	914.9393988	1482967572	1483.0	1490881312	1490.9	7.913740618	-0.999464685
Plesovice - 9	1	27.274	55	21.73	338	1	100	0.282478	0.000016	0.00020141	0.00000016	0.010468	0.000043	1.467188	0.000042	-1.5018	0.0032	-1.254	0.04	2.80458E-05	-10.85630426	0.282477822	0.000024	0.282572298	-3.3	0.9	0.282572779	1056007629	927476864	927.4768641	1502804687	1502.8	1510927959	1510.9	8.123272857	-0.999165304
Plesovice - 10	1	36.212	72	21.74	338	1	100	0.282485	0.000018	0.00007153	0.00000035	0.00363	0.000035	1.467222	0.000031	-1.4922	0.0022	-1.15	0.11	9.96036E-06	-10.60876638	0.282484937	0.000026	0.282572298	-3.1	0.9	0.282579893	1046042167	917392064	917.392064	1487234265	1487.2	1495196196	1495.2	7.961930547	-0.999703561
Plesovice - 16	2	36.153	72	18.85	338	1	100	0.282482875	0.000016	0.00012797	0.00000028	0.006348	0.000047	1.467165	0.000028	-1.5448	0.0026	-1.361	0.057	1.78195E-05	-10.6839065	0.282482762	0.000024	0.282572298	-3.2	0.9	0.282577719	1049129863	920528625	920.528625	1491993972	1492.0	1500004296	1500.0	8.010323827	-0.999469658
Plesovice - 17	2	18.811	38	20.19	338	1	100	0.282473876	0.000026	0.0000892	0.00000021	0.004823	0.000083	1.467116	0.000045	-1.5412	0.0036	-1.358	0.084	1.24209E-05	-11.00215358	0.282473797	0.000032	0.282572298	-3.5	1.1	0.282568753	1061170356	932569598	932.5695975	1511612667	1511.6	1519836639	1519.8	8.223971406	-0.99960332
Plesovice - 18	2	36.161	72	19.49	338	1	100	0.282478875	0.000015	0.00010085	0.00000033	0.005174	0.000018	1.46718	0.000036	-1.5381	0.003	-1.298	0.064	1.40431E-05	-10.82534965	0.282478786	0.000024	0.282572298	-3.3	0.8	0.282573743	1054444870	925836496	925.8364961	1506095204	1500.7	1508800394	1508.8	8.10519021	-0.999582051
Plesovice - 19	2	31.241	62	20.14	338	1	100	0.282481875	0.000019	0.00008841	0.00000012	0.004568	0.00003	1.467147	0.00003	-1.5456	0.0023	-1.323	0.089	1.23109E-05	-10.71926729	0.282481797	0.000026	0.282572298	-3.2	0.9	0.282576753	1050336347	921708963	921.7089625	1494106173	1494.1	1502140994	1502.1	8.034821323	-0.99963606
Plesovice - 20	2	35.25	71	18.72	338	1	100	0.282481875	0.000017	0.00013039	0.00000022	0.006904	0.000039	1.467148	0.000037	-1.544	0.0026	-1.199	0.073	1.81565E-05	-10.71926729	0.28248176	0.000025	0.282572298	-3.2	0.9	0.282576716	1050493123	921896939	921.8969392	1494187161	1494.2	1502220916	1502.2	8.033754352	-0.999459629
Plesovice - 6	3	36.056	72	15.89	338	1	100	0.282479649	0.000024	0.00009563	0.00000027	0.004984	0.000047	1.46724	0.000036	-1.5066	0.0034	-1.2	0.14	1.33162E-05	-10.79797544	0.282479565	0.000030	0.282572298	-3.3	1.1	0.282574521	1053377109	924762336	924.7623357	1498991064	1499.0	1507078186	1507.1	8.087054651	-0.999603684
Plesovice - 7	3	29.499	59	15.92	338	1	100	0.282474649	0.000028	0.00012436	0.00000021	0.006617	0.000062	1.467241	0.000045	-1.5074	0.0038	-1.26	0.11	1.73168E-05	-10.97479074	0.28247454	0.000033	0.282572298	-3.5	1.2	0.282569496	1060255307	916787160	916.67816	1509987520	1510.0	1518192179	1518.2	8.204659536	-0.999484619
Plesovice - 8	3	36.154	72	15.51	338	1	100	0.28248565	0.000023	0.00012971	0.00000059	0.006579	0.000027	1.467196	0.000037	-1.507	0.0036	-1.29	0.1	1.80618E-05	-10.58759486	0.282485535	0.000029	0.282572298	-3.1	1.0	0.282580491	1045378744	916769767	916.7697667	1485924617	1485.9	1493869891	1493.9	7.945274197	-0.999462447
Plesovice - 9	3	35.194	71	15.81	338	1	100	0.28249065	0.000027	0.00017185	0.00000032	0.009004	0.00005	1.467226	0.000033	-1.5136	0.0052	-1.263	0.078	2.39297E-05	-10.40897855	0.282490498	0.000033	0.282572298	-2.9	1.2	0.28258454	1038761789	910167861	910.1678613	1475059992	1475.1	1482887729	1482.9	7.82773726	-0.999287808
Plesovice - 10	3	36.19	73	15.51	338	1	100	0.28248965	0.000021	0.00012445	0.00000044	0.006635	0.000068	1.467223	0.000041	-1.508	0.0033	-1.37	0.1	1.73293E-05	-10.44434181	0.28248954	0.000028	0.282572298	-2.9	1.0	0.282584496	1039941273	911315360	911.3153599	1477157884	1477.2	1485010018	1485.0	7.852133733	-0.999484246
Temora - 1	1	33.804	68	15.03	417	2	100	0.282699	0.000026	0.0017054	0.00000093	0.062057	0.000097	1.46722	0.00004	-1.5117	0.0034	-1.275	0.015	0.000237472	-3.041179695	0.282697144	0.000032	0.28252239	6.2	1.2	0.282814381	759901670.1	601666574	601.6665745	971496873.6	971.5	974864611.3	974.9	3.367737675	-0.99293237
Temora - 2	1	33.992	68	18.96	417	2	100	0.282688	0.000021	0.000654	0.0000013	0.02196	0.00055	1.467192	0.000028	-1.5042	0.003	-1.291	0.021	9.10677E-05	-3.430167795	0.282687288	0.000028	0.28252239	5.8	1.0	0.282804525	772052860.4	612887640	612.8876396	993274084.6	993.3				

Mafic magmatism during Middle Permian at ca. 272 Ma possibly related to a continuous Permian arc.

230 Ma anatexis and metamorphism of the Guajira Arch, during back-arc extension, updoming and migmatization of the lower crust.

223 Ma crustal attenuation and development of a mylonitic detachment during core-complex emplacement.

Triassic ϵHf_i spectrum is dominated by juvenile compositions with the mixing of older crustal unradiogenic sources, whose T_{DM} model ages are indistinguishable from the Proterozoic Gondwanan basement.

190-150 Ma Early-Middle Jurassic Rifting, granitoid emplacement, and collateral arc volcanoclastic deposits and marine sediments.

Jurassic Trends of near CHUR to positive ϵHf_i values indicate mixing of primitive sources and slightly depleted compositions in the setting of a low-lying magmatic arc.

Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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