PICOSECOND PULSES FROM UV TO IR USING SPECTRO-TEMPORAL SELECTION DYE LASER

M. Martin, F. Nesa, E. Bréhéret, Y. Meyer

► To cite this version:

M. Martin, F. Nesa, E. Bréhéret, Y. Meyer. PICOSECOND PULSES FROM UV TO IR USING SPECTRO-TEMPORAL SELECTION DYE LASER. Journal de Physique Colloques, 1987, 48 (C7), pp.C7-586-C7-586. 10.1051/jphyscol:19877140 . jpa-00226961

HAL Id: jpa-00226961

<https://hal.science/jpa-00226961>

Submitted on 1 Jan 1987

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

PICOSECOND PULSES FROM UV TO IR USING SPECTRO-TEMPORAL SELECTION DYE LASER

M.M. MARTIN, F. NESA, E. BRÉHÉRET and Y.H. MEYER

Laboratoire de Photophysique Moléculaire, Bât. 213, Université de Paris Sud, F-91405 Orsay Cedex, France

High power single pulses are produced, starting from one standard 8 ns Nd:YAG laser, by the two-stage spectro-temporal selection method in a dye laser system (1). A first dye oscillator gives 150 ps pulses which are used after amplification to pump a multimode microcavity (100 to 200 μm). By filtering the emission of a single mode in the "blue" wing at 605 nm, an almost bandwidth-limited, 1.5 to 4 ps pulse is selected and amplified up to 0.3 mJ. The complex time shape of the emission from the multimode cavity without selection is studied with a streak camera and by autocorrelation. The latter shows a subpicosecond modulation, due to mode beat, within a single (amplified) spike.

Production of ps pulses at any frequency in a continuum from near-UV to near-IR is obtained by focusing these high power ps laser pulses in water. The effect of subpicosecond modulation of the multimode pulse on the efficiency and spectral shape of the continuum generation by self-phase modulation is studied. A transient quenching effect of the continuum generation by successive pulses in water is observed.

Direct conversion of the powerful ps laser pulses at 605 nm into red or near-IR ps pulses is also obtained by a simple technique involving Stokes shift in dyes and travelling wave amplification.

(1) Y.H.MEYER M.M.MARTIN E.BREHERET O.BENOIST D'AZY in "Ultrafast Phenomena V" p.89
Ed. Fleming and Siegman, Springer Verlag (1986).