Quasi-real electron method in high energy quantum electrodynamics

V. Baier, V. Fadin, V. Khoze

To cite this version:

V. Baier, V. Fadin, V. Khoze. Quasi-real electron method in high energy quantum electrodynamics. Journal de Physique Colloques, 1974, 35 (C2), pp.C2-121-C2-121. <10.1051/jphyscol:1974220>. <jpa-00215530>

HAL Id: jpa-00215530
https://hal.archives-ouvertes.fr/jpa-00215530
Submitted on 1 Jan 1974

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.
CONTRIBUTIONS

Large angle pair production in colliding beam experiments
V. N. BAIER, V. S. FADIN (*)

Abstract. — Large angle muon and pion pair electroproduction cross section for the collisions of high energy electrons and positrons has been calculated. The production of the intermediate resonance $0^+$ and $2^+$ states has been considered in case of pion production.

(*) Nuclear Physics Institute, Novosibirsk (USSR).

Quasi-real photon approximation for describing electroproduction processes
V. N. BAIER, V. S. FADIN (*)

Abstract. — A general approach is formulated for describing two-photon electroproduction processes $(e^\pm e^- \to e^\pm e^- + N)$ under conditions when only particles produced with a small total transverse momentum are observed. It is shown that in this case a number of amplitude combinations for the $\gamma + \gamma \to N$ process can in principle be determined, one of them being the cross section for the non-polarized photon photoprocess; the others enter the cross section for the photoprocess involving linearly polarized photons.

(*) Nuclear Physics Institute, Novosibirsk (USSR).

Quasi-real electron method in high energy quantum electrodynamics
V. N. BAIER, V. S. FADIN, V. A. KHOZE (*)

Abstract. — An electron pole approximation is presented, which can be used to calculate cross-sections in high energy quantum electrodynamics. A general derivation is given and some applications are considered: 1) bremsstrahlung in electron-electron (positron) collisions at large angles; 2) photoproduction and electroproduction of a pair of particles on an electron at large angles; 3) photon emission at a large angle when the cross-section does not decrease with energy; 4) total cross-section for muon pair production in electron-positron collisions.

(*) Nuclear Physics Institute, Leningrad (USSR).

On the photon spectrum emitted at large angles in high-energy $e^+ e^-$ collisions
V. S. FADIN
Nuclear Physics Institute, Novosibirsk (USSR)
V. A. KHOZE
Nuclear Physics Institute, Leningrad (USSR)

Abstract. — The authors study in particular the quasi-real photon approximation for describing reaction $e^+ e^- \to e^+ e^- e^+ e^- \gamma$, occurring via two-photon exchange.

W-meson pair production in high energy electron collisions (*)
N. L. TER-ISAACKYAN and V. A. KHOZE
Erevan Physics Institute (USSR)

Abstract. — Total cross sections for $e^\pm + e^- \to e^\pm + e^- + W^+ + W^-$ processes are obtained in the asymptotic region of initial particle energies for cases when the anomalous magnetic moment of the W-meson is zero. The covariant formulation of the Weizsacker-Williams method, whose validity is ensured by ultrarelativism of the electrons, is employed. The asymptotic behavior of the $e^+ + e^- \to W^+ + W^- + \mu^+ + \mu^-$ cross section is found.

(*) Sov. Phys. JETP.

« Equivalent photon approximation. Range of validity, accuracy, etc. »
V. M. BUDNEV, I. F. GINZBURG, G. V. MELEDIN, V. G. SERBO
Institute for Mathematics, Novosibirsk (USSR)

Abstract. — This review is devoted mainly to the two-photon production. We begin with a description of this method. The necessity of such an