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V. Baier, V. Fadin

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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 $(e^+ e^- \rightarrow e^\pm e^- + N)$ 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 $\gamma + \gamma \rightarrow N$ 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) photon-production 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 reaction $e^+ e^- \rightarrow e^+ e^- e^+ e^- \gamma$, occurring via two-photon exchange.

W-meson pair production in high energy electron collisions (*)

N. L. Ter-Isaakyan and V. A. Khoze

Erevan Physics Institute (USSR)

Abstract. — Total cross sections for $e^+ + e^- \rightarrow e^\pm e^- + W^+ + W^-$ 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 $e^+ + e^- \rightarrow W^+ + W^- + \mu^+ + \mu^-$ 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