"Two-photon production of leptons and search of new particles"
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To cite this version:

HAL Id: jpa-00215538
https://hal.archives-ouvertes.fr/jpa-00215538
Submitted on 1 Jan 1974

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c) In the region $s \gtrsim q_1^2, q_2^2/m_0^2$ these combinations are $s/q_1^2$ and $q_2^2/m_0^2$.

At $q_2^2/m_0^2 \gg 1$ the dependence on only argument $s/m_0^2 q_1^2 q_2^2$ is left and at $s/m_0^2 q_1^2 q_2^2 \gg 1$ the Regge behaviour takes place.

**Two-photon production of leptons and search of new particles**

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Abstract. — This review is devoted to the following problems:

1. Some little-known applications and effects connected with the two-photon $e^+ e^-$-pair production: energy losses of fast muons in the matter; the investigation of $\pi$ and $K$ form factors; the possibility to calibrate accelerators with the colliding $p p$, $\bar{p} p$ or $e p$ beams; measuring the high energy photon polarization, measuring the real part of proton Compton effect, etc.

2. Some processes of high order in $\alpha$ for the electron storage rings having cross section high enough, two $e^+ e^-$-pair production ($ee \rightarrow e e^+ e^- e^-$); parapositronium production; production of photons with MeV energy for large emission angles.

3. The search of new particles: intermediate vector mesons, Dirac's monopols and massive leptons.

4. Some questions of the two-photon massive $\mu$-pair production.

**Parton model for scattering**

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Abstract. — The parton model for the process $\gamma \gamma$ into hadrons is considered. The total cross section in the kinematic region $s \gg |q_1^2|, |q_2^2| \gg 1$ GeV$^2$ is obtained to be a function of a single variable: $\sigma_{\gamma \gamma} = \varphi(s/q_1^2 q_2^2)$, $s = 2 q_1 q_2, q_1, q_2$ — the photons, 4-momenta.

The two-photon process for particle production in colliding beam experiments (*)

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Abstract. — A comparison is made, for various two-photon processes ($ee \rightarrow e e^0, e e^+ \mu^-, e e^+ \pi^-$), between an exact calculation on the one hand and two alternative forms of the equivalent photon approximation (namely, the Low formula and the Dalitz-Yennie formula) on the other hand. Angular distributions of the particles produced are considered, as well as total cross sections.

Corrections to equivalent photon approximation for two-photon processes in colliding beams (*)

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Abstract. — The cross section for the two-photon process $ee \rightarrow e e^\gamma$ in colliding electron beams, in the limit $E \rightarrow \infty$ with $E^2/s$ fixed ($E$ being the energy per beam of the colliding electrons of mass $m$, and $\sqrt{s}$ the invariant mass of the state $\Gamma$) is well known to have a leading term of order $(\ln 4 E^2/m^2)^2$. This leading term is given correctly by the well-known Weizsacker-Williams approximation or the equivalent photon approximation. There are sizeable corrections coming from non-leading terms of which the first one, namely, the term of order $(\ln 4 E^2/m^2)$ has been obtained for an arbitrary hadronic final state $\Gamma$. The approximations made in getting the Weizsacker-Williams result and the correction terms due to each of them have been exhibited.

Two-photon processes for particle production at high energies (*)

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Abstract. — The literature of the past three years on the two-photon process for particle production $e^+ e^- \rightarrow e^+ e^- \gamma^* \rightarrow e^+ e^- \gamma^* \rightarrow e^+ e^- X$