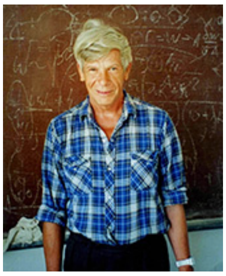

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The Resonant Breit-Wheeler Process in a Strong Electromagnetic Field.

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The resonant process of the creation of an ultrarelativistic electron–positron pair by two hard gamma quanta in a strong electromagnetic field with intensity up to $10^{27} W/cm^2$ (the Breit–Wheeler process modified by an external field) was theoretically studied. Under resonance conditions, the intermediate virtual electron (positron) in the external field comes on the mass shell. As a result, there are four reaction channels for the process instead of two. For each of those channels, the initial process of the second order in the fine structure constant effectively reduces into two successive processes of the first order: the external field-stimulated Breit–Wheeler process and the external field-stimulated Compton effect. The resonant kinematics of the process was also studied in detail. The process had characteristic threshold number of absorbed gamma quanta from an external field, and all initial and final particles had to be ultrarelativistic and propagate in a narrow cone. Furthermore, the resonant energy spectrum of the electron-positron pair significantly depended on emission angles. Clearly, there was a qualitative difference between resonant and non-resonant cases. Lastly, the resonant differential probability of studied process was obtained. The resonant differential probability significantly exceeded the non-resonant one without the external field. Theoretical predictions can be tested in international research projects (SLAC, FAIR, XFEL, ELI, XCELS).

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