

# Pair production in a field of heavy nucleus and laser pulse

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The combined field of heavy ion and strong laser pulse can be used to produce the electron-positron pairs from the vacuum. This process gives an opportunity for testing QED effects in non-perturbative regime. For experimental investigation of such effects one can use the relativistic ion beam with a strong laser source. The large Lorentz factor leads to the enhancement of laser power and frequency in the rest frame of the ion and increases the pair-production probability. In order to study the non-perturbative QED effects one needs the proper theoretical methods for description of processes in strong fields.

A method for calculation of electron-positron pair production in the combined field of heavy nucleus and laser pulse is presented. The approach is based on numerical solving of the time-dependent Dirac equation in a finite basis set. Using the developed approach the preliminary results for pair-production probabilities are obtained.

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