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Photon-photon interactions in e+e- collisions with Pythia 8

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Photon-photon interactions arising from the photons emitted by high-energy leptons will generate inevitable background processes for future electron-positron colliders. Therefore means to accurately simulate these interactions are required in order to study the realistic physics potential of these future experiments. We have been working on an implementation of these interactions into Pythia 8 Monte-Carlo generator. We will first discuss what are the relevant processes in these interactions and how these can be generated using equivalent photon approximation and parton distribution functions for resolved photons. Then we will present our recent developments including options to simulate also soft QCD processes and multiple partonic interactions in resolved photon-photon collisions. Combining these with unresolved processes enables full simulations of particle production in photon-photon interactions from lepton beams. The results for charged particle and jet production are compared to data from LEP experiments. The comparisons indicate that multipartonic interactions do play a role also in photon-photon collisions but further studies are still required to obtain accurate description of the data.

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