Contribution ID: **50**   Type: **not specified**

Photo-nuclear collisions in Pythia 8

Wednesday 11 June 2025 12:00 (20 minutes)

We present the recent developments in simulations of ultra-peripheral collisions with the Pythia 8 Monte Carlo event generator. We first review the status of recent comparisons and tuning efforts to HERA photoproduction data which provide the baseline of photon-nucleon interactions. Then we present the vector-meson-dominance (VMD) based approach to model interactions between a real photon and a nucleus target applying the Angantyr model which provides a framework for simulate heavy-ion collisions in Pythia. We compare the simulations to recent UPC data from LHC experiments, including dijets, charged-particles and heavy-flavour mesons. In addition, we present predictions for multiplicity distributions in photo-nuclear collisions at the EIC accounting for the constraints form the UPCs.

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Session Classification: Monte Carlo event generators for UPCs and photon-mediated processes

Track Classification: Monte Carlo event generators for UPCs and photon-mediated processes