

Jet production in ultra-peripheral collisions with Pythia 8

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Traditionally jet production in different collision systems has been used to study different physics: jet quenching in AA, initial-state nuclear modifications in pA and pQCD baseline in pp. There are, however, recent observations of similar collective effects in all these systems. This challenges the picture where the measurements in these different systems would provide information only on well-separated physics phenomena. In addition to these widely-studied collision systems, it is also possible to study photon-proton and photon-nucleus interactions in ultra-peripheral collisions (UPCs) at the LHC. These photon-induced processes could offer new insights on the collective phenomena and provide a clean environment to study purely initial-state effects. In this talk we discuss how these processes can be simulated with Pythia 8 general-purpose Monte Carlo event generator by applying the recent photoproduction framework. As an application, we study the potential of photo-nuclear dijets in PbPb collisions at the LHC to further constrain nuclear PDFs. In addition, we introduce our dynamical rapidity gap survival model for hard diffraction which is now implemented also for photoproduction in Pythia 8, and present predictions for diffractive dijet production in UPCs at the LHC.

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