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Measurements of the photo-production of jets in ultra-peripheral heavy ion collisions with the ATLAS detector at the LHC

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Ultra-peripheral heavy ion collisions occur when the nuclei have large impact parameter and interact through photon-induced reactions. These include processes in which an energetic photon emitted by one nucleus resolves the partonic structure of the other and stimulates jet production. Much like deep inelastic scattering, such processes provide a clean probe of the nuclear parton distributions. This is in contrast to other observables in ion-ion and proton-ion collisions which typically involve the convolution of parton distributions in both incident particles. Thus jet photo-production represents the most direct opportunity to study nuclear parton distributions until a future electron-ion collider is constructed. This talk presents new measurements of ultra-peripheral jet photo-production in Pb+Pb collisions with the ATLAS detector at the LHC. Events are selected using a combination of forward neutron and rapidity gap requirements. Final states with two or more jets are used to construct event level observables H_{T}, x_{A} and z_γ, which characterize the hard scattering process. Measurements of differential cross sections in these three quantities, after unfolding for detector response, are presented. The results are compared with theoretical calculations using different nPDF parameterizatinos, which highlight the potential of this data in future global analysis for precision nPDF determination.

Content type

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Collaboration

ATLAS

Centralised submission by Collaboration

Presenter name already specified

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