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Measurement of dijet photoproduction in ultraperipheral Pb+Pb collisions with ATLAS

In ultra-relativistic heavy ion collisions, the charged ions produce an intense flux of equivalent photons. Photon-induced processes are the dominant interaction mechanism when the colliding nuclei have an impact parameter larger than the nuclear diameter. In these ultra-peripheral collisions (UPCs), the photon provides a clean, energetic probe of the partonic structure of the nucleus, analogous to deep inelastic scattering. This talk presents a measurement of jet production in UPCs performed with the ATLAS detector using high-statistics 2018 Pb+Pb data. Events are selected using requirements on jet production, rapidity gaps, and forward neutron emission to identify inclusive photo-nuclear hard-scattering processes. These measurements also include detailed studies of rapidity gap distributions and nuclear break-up effects, allowing for precise comparisons between data and theory for inclusive photo-nuclear processes. The measured cross-sections are compared to theoretical models in phase-space regions where significant nuclear PDF modifications are expected but not well constrained by world data, demonstrating the potential of these data to provide a strong new constraint on nPDF effects.

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