

Electroweak, Jet and Heavy Flavor Probes in Proton-Lead Collisions at the LHC

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Measurements of isolated prompt photon, massive electroweak boson, and jet production in small collision systems are of great interest to understanding the partonic structure of heavy nuclei, and serve as a constraint on the initial state in larger collision systems. These channels are sensitive to a variety of effects such as the modification of the parton densities in nuclei, including the possible onset of non-linear QCD effects in certain kinematic regions, and the energy loss of partons as they undergo multiple interactions in the nucleus before the hard parton-parton scattering. High-statistics samples of proton-lead collision data at $\sqrt{s_{NN}} = 5.02$ TeV and 8.16 TeV taken in 2016, as well as proton-proton comparison data at analogous collision energies, allow for a detailed study of these phenomena in data and comprehensive comparisons to the predictions of a variety of theoretical approaches. This talk presents the latest ATLAS and CMS results in these and other topics, including new results from Run 2 proton-lead collisions on inclusive prompt photon production over a broad kinematic range, and angular correlations of forward dijets intended to probe the small- x region. Results will also be shown on yields and two-particle correlations involving open and closed heavy flavor mesons, both measured directly and through their semileptonic decays, to study energy loss and transport properties of heavy quarks in the QGP.

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