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Charged particle production in proton-lead collisions measured by the ATLAS detector

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Measurements of the centrality dependence of low-p_T and high-p_T particle production in proton-lead collisions at the LHC can provide unique insight into the dynamics of soft and hard scattering processes and the initial state of ultra-relativistic nuclear collisions. Recent results have shown that both soft and hard processes may be significantly influenced by event-to-event fluctuations (variations) in the structure of the proton. In this talk, the latest measurements of the centrality dependence of charged particle, jet, and Z boson production with the ATLAS detector at the LHC will be used to explore these questions. In particular, the sensitivity of the charged particle pseudorapidity distribution in proton–lead collisions to the choice of centrality variable will be discussed. Separately, the strong centrality dependence of jet production in proton–lead collisions has raised questions about energy production at large rapidities in collisions involving a large proton-x. To address this, measurements of the correlation between the initial-state hard scattering kinematics in dijet events and forward transverse energy in proton-proton collisions will be presented.

On behalf of collaboration:

ATLAS

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