

# Probing initial state effects in nuclear collisions via dijet and spectator neutron measurements with the ATLAS detector

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The measurement of dijets in proton-lead collisions at the LHC provides unique possibilities to investigate both nuclear and nucleon initial state effects as a function of the parton scattering kinematics. In particular, color fluctuations can significantly change the average interaction strength of the proton, biasing both the event activity and the number of wounded nucleons in the Pb nucleus. In this talk, we present recent results obtained by the analysis of dijet events as a function of the event activity in p+Pb data at  $\sqrt{s_{NN}} = 8.16$  TeV collected by ATLAS in 2016. Both the dijet and spectator neutron yields are analyzed by constructing a central-to-peripheral ratio (RCP). The ratios are correlated with the Bjorken- $x$  of the parton extracted from the proton in the hard-scattering, which provide complementary constraints for color fluctuation modeling. The dijet yield RCP exhibits a clear event activity bias, while the spectator neutron RCP is a novel observable sensitive to the number of wounded nucleons and the dynamics of nuclear evaporation.

## Category

Experiment

## Collaboration

ATLAS

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