Contribution ID: **91** Type: **not specified**

Small-x physics using ZDC at the LHC in UPCs and beyond

Thursday 12 June 2025 08:50 (20 minutes)

We consider production of very forward neutrons in photon-nucleus and proton-nucleus inelastic collisions, which are detected in the LHC detectors by zero degree calorimeters (ZDC) with efficiency close to one. We argue that such measurements would provide a new probe of nuclear shadowing in soft and hard regimes of QCD. In particular, we calculate the distribution over the number of evaporation neutrons produced in photon-nucleus collisions in the kinematics of heavy ion UPCs at the LHC and show that it is correlated with the number of wounded nucleons (inelastic collisions) and, hence, can constrain the mechanism of nuclear shadowing and its x and impact parameter dependence. We also present an extension of these ideas to dijet production in pA scattering, which allows us to semi-quantitatively
explain the recent ATLAS data. Possible strategies for observing an onset of the black disk regime are also described.

Author: STRIKMAN, Mark (Pennsylvania State University (US))

Presenter: STRIKMAN, Mark (Pennsylvania State University (US))

Session Classification: Inclusive and diffractive processes and photon, proton and nuclear structure

Track Classification: Inclusive and diffractive processes and photon, proton and nuclear structure