



Contribution ID: 69

Type: **Oral Presentation**

Color fluctuation phenomena in photon(proton) – nucleus collisions

Friday 11 September 2015 15:00 (25 minutes)

We explain that a wide range of high energy nuclear phenomena is related to the phenomenon of fluctuations of strength of interaction of the projectile with nucleons (color fluctuations) and large coherence length of the interaction. Connection of the color fluctuation phenomenon to the mechanism of the leading twist shadowing is reviewed, predictions of the theory are compared to the first LHC data. The key role of the studies of ultra peripheral collisions at the LHC for the progress in the field is emphasized. Evidence for the x-dependent color fluctuations in nucleons is presented.

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