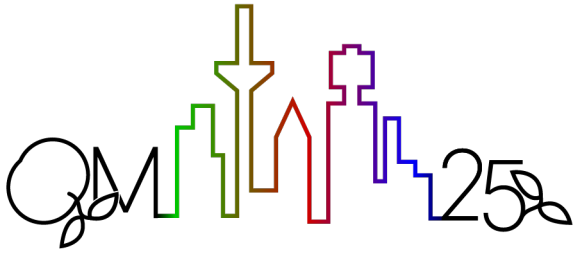

Contribution ID: **984** Type: **Oral**

First energy-dependent measurement of incoherent J/Psi photoproduction in PbPb UPCs at 5.02 TeV at CMS

Wednesday 9 April 2025 11:30 (20 minutes)

The study of J/ψ photoproduction in ultraperipheral collisions (UPCs) offers a powerful probe of gluon dynamics in heavy nuclei. In UPCs, photons can interact with the nucleus coherently (involving the entire nucleus) or incoherently (with individual constituents). While coherent processes provide insight into the average gluon density, incoherent photoproduction is uniquely sensitive to the local gluon density fluctuations at both nucleonic or subnucleonic levels. In this talk, we present the first energy-dependent measurement of the incoherent J/ψ photoproduction cross section in PbPb UPCs at the LHC with the CMS experiment. Employing forward neutron tagging technique, we explore a wide photon-nucleon center-of-mass energy range from 40 to 400 GeV, probing fluctuating gluon fields over a broad Bjorken-x range of $x < 10^{-4}$. Furthermore, we report the cross section ratio of incoherent to coherent J/ψ production and evaluate the nuclear suppression factor for the incoherent production as a function of x. By comparing state-of-the-art theoretical predictions, these results offer unique insights into gluon fluctuations and have important implications for understanding nuclear gluon distributions and saturation phenomena.

Category

Experiment

Collaboration (if applicable)

CMS

Author: HUANG, Xiao (Rice University (US))

Presenter: HUANG, Xiao (Rice University (US))

Session Classification: Parallel session 34

Track Classification: Physics of ultraperipheral collisions