

11th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions



Beitrag ID: 155

Typ: Talk

Probing a new regime of ultra-dense gluonic matter using high-energy photons with the CMS experiment

Mittwoch, 29. März 2023 11:10 (20 Minuten)

In ultraperipheral collisions (UPCs) of relativistic heavy ions, the coherent heavy-flavor vector meson production via photon-nuclear interactions is of particular interest, since its cross section is directly sensitive to the nuclear gluon density. However, in experimental measurements, because each of the two nuclei in symmetric UPCs can serve both as a photon-emitter projectile and a target, this two-way ambiguity has prevented us from disentangling contributions involving high- and low-energy photon-nucleus interactions, thus limiting our capability of probing the extremely small- x regime, where nonlinear QCD effects are expected to emerge. In this talk, we will present a new measurement of coherent J/ψ photoproduction, where the two-way ambiguity is solved by implementing for the first time a forward neutron tagging technique in UPC PbPb collisions at 5.02 TeV. The coherent J/ψ photoproduction cross section will be presented as a function of the photon-Pb center-of-mass energy in UPCs up to about 400 GeV, corresponding to an extremely low x of $\sim 5 \times 10^{-5}$. We will discuss the physics implications of this new result, as well as exciting opportunities in future LHC heavy ion runs.

Experiment/Theory

CMS

Affiliation

CMS

Hauptautor: LI, Wei (Rice University)

Vortragende(r): LI, Wei (Rice University)

Sitzung Einordnung: Parallel: Early-Time Dynamics & nPDFs

Track Klassifizierung: Early time dynamics and nuclear PDFs