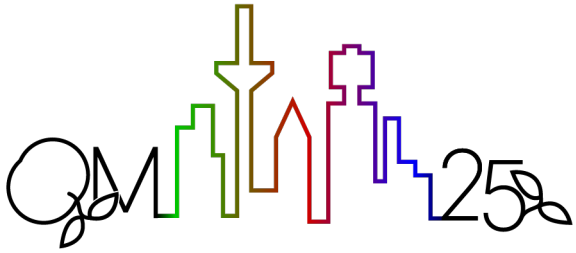

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First measurement of coherent Υ photoproduction in PbPb UPCs at 5.02 TeV with the CMS experiment

Coherent photoproduction of vector meson (VM) in heavy-ion ultrapheripheral collisions (UPCs) is highly sensitive to the gluon distributions within heavy nuclei, making it a powerful tool for probing the nuclear gluonic structure. It is of particular interest for investigating nonlinear dynamics such as gluon saturation and nuclear shadowing effects in the small Bjorken-x region. The mass of VM determines the energy scale of the photonuclear interactions, meaning that measurements of different VMs provide varying sensitivities to these nonlinear dynamics. In particular, the measurement of coherent Υ photoproduction provides a unique opportunity to explore the nuclear gluonic structure at the highest energy scales among these processes. However, due to the extremely low production rate, a direct measurement of coherent Υ photoproduction in heavy-ion UPCs has not yet been achieved. In this talk, we will present the first observation of coherent Υ photoproduction of a heavy nucleus using the dataset from PbPb UPCs at 5.02 TeV, recorded by the CMS experiment. The differential cross section will be presented as a function of Υ rapidity in the range $0 < |y| < 2.4$. Additionally, the nuclear suppression factor will be presented. The results will be compared to theoretical model calculations, and the relevant physics implications will be discussed.

Category

Experiment

Collaboration (if applicable)

CMS

Author: ALCERRO ALCERRO, Luis (The University of Kansas (US))

Presenter: ALCERRO ALCERRO, Luis (The University of Kansas (US))

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