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Constraining nuclear PDFs at low- x with the first measurements of the D^0 production in ultraperipheral heavy ion collisions with CMS

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In this talk, we present the first measurement of D^0 photoproduction in heavy ion ultraperipheral collisions (UPCs) using the data collected by CMS experiment during 2023 PbPb collisions at LHC. The measured production cross sections are presented as a function of the D^0 transverse momentum ($2 < p_T < 12$ GeV/c) and rapidity ($-2 < y < 2$). Additionally, we will present new results from a much larger data sample from 2024 PbPb UPCs, which could significantly improve the data precision and extend the measurements to zero p_T . The results are compared to theoretical calculations that exploit different modeling of the nuclear parton distribution functions (nPDFs) and provide new constraints into the properties of nuclear matter at low x down to $x 10^{-4}$ and for Q^2 ranging from $O(10)$ to $O(100)$ GeV², in absence of significant final-state effects.

Category

Experiment

Collaboration (if applicable)

CMS

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