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ALICE Measurements of Coherent ρ^0 Photoproduction in Pb-Pb Ultra-peripheral Collisions

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The powerful photon fluxes of relativistic nuclei provide the possibility to study photonuclear and two-photon interactions in ultra-peripheral collisions (UPC), where the nuclei do not overlap and no strong nuclear interactions occur. Within the Vector Meson Dominance Model (VDM), the ρ^0 contribution dominates the QCD part of the photon structure function. The $\gamma+A \rightarrow \rho^0+A$ process in heavy-ion UPC is an excellent tool to test the black disk regime, where the target nucleus appears like a black disk and the total ρ^0+A cross section reaches its limit. RHIC and first LHC results have deviated from some Glauber+VDM calculations, which thus call for new data. ALICE reports the first measurements of coherent ρ^0 photoproduction accompanied by electromagnetic dissociation (EMD) with data taken at $\sqrt{s_{NN}} = 5.02$ TeV. The rapidity-dependent cross section

of coherent ρ^0 photoproduction is measured and it is compared to theoretical models. In addition, a resonance-like structure around $1.7 \text{ GeV}/\sqrt{s}$ is observed.

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