## XXVIII International Workshop on Deep Inelastic Scattering and Related Subjects



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## Coherent photoproduction of p^0 vector mesons in ultra-peripheral Pb-Pb collisions at √sNN=5.02 TeV with ALICE

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The electromagnetic field of a fast charged particle can be described as a flux of quasi-real photons whose intensity is proportional to the square of the electric charge of the particle. In the case of lead ions circulating in the LHC there are copious photonuclear interactions. If the impact parameter of the colliding lead ions is larger than the sum of their radii, photon-induced processes dominate the interaction rate via ultra-peripheral collisions (UPC). The study of a \rho^0 meson photonuclear production is important, because its cross section in Pb–Pb UPC at the LHC is so large that it becomes a proper tool to research the approach to the black-disk limit of QCD.

First measurements of the cross sections for the coherent photoproduction of  $rho^0$  mesons in Pb–Pb UPC at sqrt(s\_NN)=5.02 TeV with the ALICE experiment at LHC are presented in three regions of rapidity covering the range |y|<0.8. At each rapidity, cross sections are given for different nuclear-breakup classes defined according to the presence of neutrons measured in zero-degree calorimeters. The results are compared with those from lower energies and with model predictions.

The method used to extract the different contributions for the photonuclear processes to the UPC cross section has been improved using forward neutron classes, which is specially important in view of the expected data samples to be recorded at the LHC during the Run 3 and 4.

Finally, the observation of a coherently produced resonance-like structure with a mass around 1.7 GeV/c<sup>2</sup> and a width of about 140 MeV/c<sup>2</sup> is reported and compared with similar observations from other experiments.

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