Contribution ID: **459** Type: **Contributed Talk**

Coherent photoproduction of ρ^0 vector mesons in ultra-peripheral Pb-Pb and Xe-Xe collisions with ALICE

Wednesday, 14 April 2021 13:27 (18 minutes)

Lead ions circulating in the LHC provide copious photonuclear interactions.
These dominate the interaction rate via ultra-peripheral collisions (UPC),
when the impact parameter of the colliding lead ions is larger than the sum of their radii.
The study of \rho^0 meson photonuclear production is important,
because its cross section in 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 and in Xe–Xe UPC at sqrt(s_NN)=5.44 TeV are presented.
Both the Pb–Pb and Xe–Xe 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 measurements were used to determine the A dependence at W\gamma-p=65 GeV.

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

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Session Classification: Small-x, Diffraction and Vector Mesons

Track Classification: Small-x, Diffraction and Vector Mesons