

## Photoproduction of Vector Mesons in Ultra-Peripheral Pb-Pb Collisions at the LHC

The strong electromagnetic fields surrounding the Pb-ions accelerated at the CERN Large Hadron Collider (LHC) allow two-photon and photonuclear interactions to be studied in a kinematic regime so far unexplored. In ultra-peripheral collisions, with impact parameters larger than the sum of the nuclear radii, hadronic interactions are strongly suppressed but the cross sections for electromagnetic or photon-induced interactions are large. The interactions can be purely electromagnetic (two-photon interaction) or a photon from the field of one of the nuclei may interact with the other nucleus (photonuclear interaction). Exclusive interactions, where both nuclei remain in their ground state, are dominated by coherent photonuclear vector meson production and two-photon production of di-lepton pairs.

During the heavy-ion run at the LHC in 2010 where Pb-Pb collisions at an energy of  $\sqrt{s_{NN}} = 2.76$  TeV were studied, the ALICE Experiment had triggers enabled for exclusive particle production in ultra-peripheral collisions. These included trigger information from the Time-of-Flight, Silicon Pixel, and V0 Detectors. A trigger for ultra-peripheral collisions was also enabled in the muon arm. The integrated luminosity for the ultra-peripheral triggers corresponds to about  $3.6 \text{ microb}^{-1}$ . Results on photoproduction of  $\rho^0$  and  $J/\Psi$  from the data collected with these triggers will be presented.

Coherent  $\rho^0$  production at mid-rapidity at the LHC corresponds to a photon-nucleon center of mass energy of 45 GeV, roughly a factor of 4 higher than has been studied before. Photoproduction of  $J/\Psi$  is of particular interest, since it has been proposed as a sensitive probe of the nuclear gluon distribution down to  $x = 10^{-3}$ . The results can be compared with models with different mechanisms for the nuclear shadowing.

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