



Contribution ID : 856

Type : Oral presentation

## Ultra-peripheral heavy-ion collisions with ALICE and CMS

*Saturday, 5 July 2014 15:00 (20)*

Protons and ions accelerated by the LHC carry an electromagnetic field, which acts as a source of photons. The beam energy at the LHC makes it the most energetic photon source ever built. The interaction of such high-energy photons with nuclei (or protons) can be studied in ultra-peripheral heavy-ion collisions, where the impact parameter is larger than the sum of the nuclear radii and hadronic interactions are therefore strongly suppressed.

Both the ALICE and CMS collaborations have studied photonuclear production of vector mesons in ultra-peripheral Pb-Pb and p-Pb collisions. The process effectively corresponds to an interaction between a photon, generated from the electromagnetic field of one of the nuclei with the other (target) nucleus. The ALICE Collaboration has already published results on exclusive photoproduction of  $J/\psi$  mesons at mid and forward rapidities in Pb-Pb collisions. The cross section for this process is particularly sensitive to the nuclear gluon distribution.

In this talk, the latest results from ALICE and CMS on exclusive production of light and heavy vector mesons in ultra-peripheral Pb-Pb collisions will be presented, as well as the measurement of exclusive heavy vector meson photoproduction off protons in ultra-peripheral p-Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV. Exclusive photoproduction of quarkonia is a powerful tool to search for parton saturation effects. Although gluon saturation is expected to occur at some scale to limit the growth of the Parton Distribution Function (PDF) at low Bjorken- $x$  values, no compelling evidence for this effect has been found so far. ALICE results provide direct tests of the power law dependence on the  $J/\psi$  photoproduction cross section over a wide range of  $\gamma p$  energies. CMS results on quarkonia photoproduction in p-Pb will also be presented. The prospects for future analyses on ultra-peripheral collisions at the highest LHC energy will also be discussed.

### Summary

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**Session Classification :** Heavy Ions

**Track Classification :** Heavy Ion Physics