



Contribution ID : 852

Type : Oral presentation

Exclusive two-photon production of W-pairs in heavy-ion and proton-proton collisions

Saturday, 5 July 2014 16:00 (20)

The strong electromagnetic fields surrounding the protons and heavy nuclei accelerated at the CERN Large Hadron Collider may be used to study two-photon and photon-proton/nucleus interactions at unprecedented energies. A process of particular interest is two-photon production of pairs of W bosons. This process is sensitive to the coupling between photons and W bosons, and may therefore be used to probe in particular any anomalous quartic $WW\gamma\gamma$ coupling. The experimental feasibility of studying this process has recently been shown by the CMS experiment.

In this presentation, we calculate the expected standard model cross section for this process. The strong absorption is treated in a realistic way to properly exclude interaction where the projectiles interact hadronically. In addition, the polarization of the W and how it affects the angular distribution of its decay products is investigated. These two effects have to our knowledge not been considered in previous calculations. They are found to be essential for the calculation of the production cross section and for the expected yield within an experimentally accessible phase space region.

Summary

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Session Classification : Heavy Ions

Track Classification : Heavy Ion Physics