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Measurements of $\gamma\gamma \rightarrow \mu^+\mu^-$ with the ATLAS detector at the LHC

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In heavy ion collisions, the intense electromagnetic fields result in a high rate of photon-photon collisions. The cross section for the process $\gamma\gamma \rightarrow \mu^+\mu^-$ involves the equivalent photon fluxes from the nuclei and elementary cross sections calculated in QED. These fluxes also arise in the calculation of exclusive vector meson production and ultra-peripheral jet photo-production, which may be used to constrain nuclear parton distributions. Thus measurements of $\gamma\gamma \rightarrow \mu^+\mu^-$ provide an important tool to calibrate the photon fluxes. This talk presents such measurements performed with the ATLAS detector. This includes new results correlating the dimuon system with neutron multiplicity measured with Zero Degree Calorimeters. A careful analysis of the acoplanarity distributions is also presented that includes the effects of final-state QED radiation and contributions from dissociative and background processes. The new results are sufficiently-precise to constrain and tune theoretical models.

Content type

Experiment

Collaboration

ATLAS

Centralised submission by Collaboration

Presenter name already specified

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