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Measurement of $\gamma\gamma \rightarrow \mu^+\mu^-$ pairs in non-ultra peripheral Pb+Pb collisions with the ATLAS detector

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ATLAS measurements of dimuons produced via $\gamma\gamma$ scattering processes in inelastic, non-ultra-peripheral Pb+Pb collisions at 5.02 TeV are presented using an integrated luminosity of 1.9 nb^{-1} . The $\gamma\gamma \rightarrow \mu^+\mu^-$ pairs are identified via selections on pair momentum asymmetry and acoplanarity, and the contribution from the heavy flavor decay background is estimated using a template fit method. The pair yields are measured differentially as functions of the centrality, average transverse-momentum (p_T) and rapidity of the pair. The measurement shows a depletion in the number of muon pairs near zero acoplanarity in central events, resulting in the distributions peaking at non-zero values of acoplanarity. Fits to the perpendicular transverse momentum (k_\perp) distributions are used to estimate the centrality dependence of this peak position. The most probable is shown to increase from the most peripheral to the most central collisions, reaching a value of $k_\perp = 36 \pm 1 \text{ MeV}$ in the 0-5% most-central collisions. The ability of these measurements to qualitatively differentiate between different physical origins of the observed centrality and p_T dependence are discussed.

Collaboration (if applicable)

ATLAS

Track

Electroweak Probes

Contribution type

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