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Flash-1: 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 both template and asymptotic fit methods. 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, including comparisons to several theoretical calculations, are discussed.

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