

Observation of light-by-light scattering and search for axion-like particles with the CMS experiment

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Ultrapерipheral lead-lead collisions at $\sqrt{s_{NN}} = 5.02$ TeV produce such very large photon fluxes that the fundamental, and very rare, quantum-mechanical process of Light-by-light (LbyL) scattering can be observed. The studies of LbyL scattering in ultraperipheral PbPb collisions data collected during the 2015 and 2018 LHC runs will be presented, using samples corresponding to integrated luminosities of about 0.4 nb^{-1} and 1.6 nb^{-1} , respectively. The cross section for this process is sensitive to the possible existence of axion-like particles. The four times more luminosity with 2018 PbPb collisions provides an access to axion mass and coupling ranges that are inaccessible with pp data, opening a unique window through which to search for physics beyond the Standard Model.

Secondary track (number)

1. Dark Matter Detection

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