

# 10th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions



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Type: **Poster Presentation**

## Light-by-light scattering and search for axion-like particles with the CMS detector

The very strong electromagnetic fields found in PbPb collisions at the LHC make it effectively a photon-photon collider. Observation of the light-by-light scattering process,  $\gamma\gamma \rightarrow \gamma\gamma$ , in ultraperipheral PbPb collisions at a centre-of-mass energy per nucleon pair of 5.02 TeV recorded in 2018 by the CMS experiment is reported. The exclusive production of dielectrons is used as a process of similar production mechanism and experimental signature to control both the theoretical modeling and the reconstruction of low energy electromagnetic objects in the detector. Differential distributions in diphoton  $p_T$ , rapidity, mass, and acoplanarity are reported. The  $m_{\gamma\gamma}$  distribution is used to set new exclusion limits on the production of pseudoscalar axion-like particles, via the  $\gamma\gamma \rightarrow a \rightarrow \gamma\gamma$  process, down to 5 GeV.

### Collaboration (if applicable)

CMS

### Track

Electroweak Probes

### Contribution type

Contributed Talk

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