

## Results on photon-induced processes in ultra-peripheral Pb+Pb collisions with ATLAS

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In ultra-relativistic heavy-ion collisions, copious rates of  $\gamma\gamma$  processes are expected through the interaction of the large electromagnetic fields of the nuclei, which enables the production of particles such as leptons, virtual axion-like particle, magnetic monopoles, or can lead to light-by-light scattering via loop diagrams, and even higher-order processes where additional photons are exchanged. In ultra-peripheral collisions (UPCs), characterized by large impact parameter between the nuclei, the outgoing leptons, photons, or monopoles, exhibit back-to-back production in the transverse plane which provides precise and efficient identification. This talk presents recent measurements of dilepton production as well as new measurements that assess the rate of additional photon exchange which leads to vector meson or forward neutron production. The study of these secondary photon exchanges can give detailed insights into the photon flux and field configuration as well as the geometry of the collisions. Also presented is a more recent search for monopole-pair production in UPCs with monopole masses ranging from 2–100 GeV. The results are compared with a leading-order model of spin-1/2 particle production from photon-photon fusion and a recently developed semi-classical model that includes non-perturbative cross section calculations.

### Category

Experiment

### Collaboration

ATLAS

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