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Measurements of photon-photon fusion processes in ultra-peripheral Pb+Pb collisions with ATLAS

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Relativistic heavy-ion beams are accompanied by a large flux of equivalent photons, giving rise to a set of photon-induced processes. These can lead to photon-photon interactions in ultraperipheral collisions. This talk presents a series of measurements of such processes performed by the ATLAS Collaboration. New measurements of exclusive dilepton production (electron, muon, or tau pairs) are presented. This process provides detailed constraints on the nuclear photon flux and its dependence on the impact parameter and photon energy. In particular, the study of the cross-sections in the presence of forward neutron production, provides an additional experimental handle on the impact parameter range sampled in the observed events. The final ATLAS measurements of light-by-light scattering are also presented. These measurements are performed using the full Run-2 dataset which results in substantially reduced uncertainties compared to the previous measurements. They provide a precise and unique opportunity to investigate extensions of the Standard Model, such as presence of axion-like particles.

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