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Observation of light-by-light scattering and new results from ultra-peripheral heavy-ion collisions in the ATLAS experiment

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Light-by-light (LbyL) scattering, $\gamma\gamma \rightarrow \gamma\gamma$, is a very rare process allowed in Quantum Electrodynamics via a loop diagram. The precise measurement of this process is potentially sensitive to contributions from Beyond Standard Model. Despite the small cross-section, the LbyL scattering can be observed in ultra-peripheral high energy heavy-ion collisions due to strong electromagnetic fields accompanying the lead beam. In this talk we discuss the first direct observation of LbyL scattering established by ATLAS Collaboration using 2018 Pb+Pb dataset. We also summarize other new measurements done using ultra-peripheral events such as the measurement of multi-particle correlations and measurement of di-muon production.

Author: ATLAS COLLABORATION

Presenter: TAYALATI, Yahya (Universite Mohammed V (MA))

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