



Contribution ID: 237

Type: **Parallel session talk**

# Di-muons production from two-photon scattering in Pb+Pb collisions with the ATLAS detector

*Thursday, 29 July 2021 17:00 (15 minutes)*

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 both ultraperipheral collisions, where the nuclei do not overlap, as well as in hadronic processes accompanied by the production of hot, dense matter. The latter provides a potentially sensitive electromagnetic probe of the quark-gluon plasma. This talk presents a series of measurements of such processes performed by the ATLAS Collaboration. New measurements of exclusive di-muon production, which provide detailed constraints on the nuclear photon flux and its dependence on impact parameter and photon energy. In particular, the study of the di-muon 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 same process of dileptons produced via two-photon scattering in non-ultra-peripheral (non-UPC) nucleus-nucleus collisions first measured by ATLAS and STAR showed an unexpected centrality-dependent broadening of the angular correlation between the two leptons and/or of the two-lepton  $p_T$  distribution. Full statistic of run 2 dataset allow new features to be observed in the data, both in the yields of the pairs as well as in their angular distributions. Differential measurements of the dependence of the pair-distribution on the transverse-momentum and rapidity of the two muons, as well as the dependence on the event centrality will be presented, and the possible physics implications will be discussed.

## Collaboration / Activity

ATLAS

## First author

## Email

**Primary authors:** COLLABORATION, ATLAS; COLE, Brian (Columbia University)**Presenter:** COLE, Brian (Columbia University)**Session Classification:** T05: Heavy Ion Physics**Track Classification:** Heavy Ion Physics