

The ATLAS TRT Fast-OR Trigger for Ultra-Peripheral Heavy-Ion Collisions

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The ATLAS heavy-ion group has made important observations lately including light-by-light scattering and tau-lepton pair production in lead-ion runs at the LHC. These analyses are part of the ultra-peripheral physics program, which studies events in which the electromagnetic clouds around the ions interact rather than the lead-ion nuclei themselves, giving photon-photon interactions at high energy. In order to further this program of study, higher statistics at low lepton transverse momentum is needed, but no suitable trigger existed in the ATLAS detector to capture such events. In order to provide such a trigger, the ATLAS Transition Radiation Tracker FastOR trigger capability, which was used to trigger on cosmic rays, has been adapted for use in Pb-Pb collisions. The FastOR commissioning procedure and tuning of parameters for the heavy ion physics program are presented, as well as the performance results from the October 2023 heavy ion run.

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