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Central diffraction and ultra-peripheral collisions in ALICE in Run 3 and 4

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The ALICE experiment at the LHC is undergoing a major upgrade during Long Shutdown 2 (2019-2020). In particular, the Time Projection Chamber (TPC) is being equipped with new GEM-based readout chambers and the readout electronics of several detectors is being replaced with faster and more flexible technology. This will allow ALICE to read out most of the detectors in the continuous mode and record minimum bias Pb-Pb events at rates of about 50 kHz in Run 3 (2021-2024) and Run 4 (2027-2030). The ALICE collaboration is also considering the possibility to collect a large sample of proton-proton collisions at interaction rates of about 1 MHz using online and offline preselection of rare events. These goals require a completely new online computing system that will be used to perform fast reconstruction and compression of the data stream. The event selection strategy becomes especially challenging for the case of rare central diffractive events and ultra-peripheral Pb-Pb collisions characterized by rapidity gaps at forward and backward directions with only few tracks at central rapidity. In this contribution, the motivation for studying central diffractive and ultra-peripheral events is presented, and feasibility studies for their selection in runs 3 and 4 will be given.

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