

The Fast Interaction Trigger for ALICE LHC Run 3 and 4

Saturday, October 17, 2020 11:25 AM (25 minutes)

As part of the preparations for the LHC Run 3 and 4, the ALICE experiment at CERN is undertaking a thorough upgrade of the setup. In particular, all ALICE subsystems have to cope with the increased interaction rate of 50 kHz in Pb-Pb and up to 1 MHz in pp collisions. Compared to Run 2, this is up to two orders of magnitude more collisions. Although the solution for the majority of ALICE detectors is to switch to a continuous readout, several of the older systems (TRD, CPV, HMPID, EMCAL, DCAL and PHOS) would still need an external trigger or a wakeup signal.

The Fast Interaction Trigger (FIT) will generate a minimum-bias and a multiplicity trigger with the maximum latency below 425 ns. It will also measure the collision time with a resolution of < 40 ps and serve as the main ALICE luminometer, providing direct, real-time feedback to the LHC for the beam tuning. In the offline analysis FIT will aid in the reconstruction of the vertex position, assess forward particle multiplicity, centrality and event plane, and will be used for the study of diffractive physics at forward rapidity.

FIT consists of three sub-systems: a fast Cherenkov detector array using MCP-PMTs as photosensors, a large scintillator ring employing a novel light collection system, and a scintillator-based Forward Diffractive Detector. After a short description of the detector components, functionalities and a brief summary of the physics objectives, the key test results of the assembled detector will be presented and discussed.

Primary author: SLUPECKI, Maciej (University of Jyväskylä (FI))

Presenter: SLUPECKI, Maciej (University of Jyväskylä (FI))

Session Classification: Section 3. Modern nuclear physics methods and technologies

Track Classification: Section 3. Modern nuclear physics methods and technologies.