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# ALICE forward rapidity upgrades

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The upcoming upgrade of the CERN LHC injectors during 2019-20 will boost the luminosity and the collision rate beyond the design parameters of several of the key ALICE detectors including the forward trigger detectors. The nominal Pb-Pb interaction and readout rate for ALICE after LS2 will reach 50 kHz. To face this challenge the Fast Interaction Trigger (FIT) is being designed and constructed. FIT will be the main forward trigger, luminometer, and collision time detector. It will also determine multiplicity, centrality, and reaction plane of heavy ion collisions.

The detector will consist of two arrays of Cherenkov radiators with MCP-PMT sensors and of a single scintillator ring. The arrays will surround the beam pipe on the opposite sides of the interaction point: at ˜820 mm on the hadron absorber side and at ˜3200 mm on the other side, where also the scintillator ring of a diameter of 1489 mm will be located. The resolution of the interaction time extracted from the Cherenkov arrays will be equal or better than 40 ps for low multiplicity events and better than 30 ps at higher multiplicities. The centrality and event plane resolution will be similar to those of the present ALICE apparatus. The first prototype of the Cherenkov module together with the frontend electronics are already installed and in operation at ALICE in parallel with the other forward detectors.

The presentation will contain a short introduction to FIT, followed by the latest refinements of the FIT geometry together with performance of the prototype, new modifications to the MCP-PMT sensor, electronics scheme with digital trigger and continuous readout, as well as the results of the FIT performance simulations.

## Experimental Collaboration

ALICE Collaboration

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