

# The new Fast Interaction Trigger detector for the ALICE Upgrade

The upcoming upgrade of the CERN LHC injectors during 2019-20 will boost the luminosity and the collision rate beyond the design parameters for several of the key ALICE detectors including the forward trigger detectors. The nominal Pb-Pb interaction and readout rate for ALICE after LS2 will be of 50 kHz. To remedy this problem 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 be placed around the beam line on the opposite sides of the interaction point: at  $\sim 800$  mm on the hadron absorber side and at  $\sim 3200$  mm on the other side where also a 1489 mm diameter scintillator ring 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 to the other forward detectors. In the presentation the performance of the prototype will be shown together with the latest refinements of the FIT geometry, new modifications to the MCP-PMT sensor, electronics scheme with digital trigger and continuous readout as well as update on simulation results.

## Preferred Track

Future Experimental Facilities, Upgrades, and Instrumentation

## Collaboration

ALICE

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