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# Forward instrumentation for the ALICE Upgrade: the Fast Interaction Trigger and the FoCal proposal

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Two additions to the forward instrumentation of ALICE will be described: the new Fast Interaction Trigger (FIT) and the Forward Calorimeter (FoCal). The former will be installed during the Long Shutdown 2 (2019/2020), while the latter is proposed for Long Shutdown 3 (2024-2026).

The FIT detector provides a fast trigger, a precise collision time measurement for time-of-flight based particle identification, and will be the main ALICE luminometer. FIT will measure an unbiased multiplicity distribution in the forward direction needed for the determination of the centrality and of the event plane in heavy-ion collisions. FIT is composed of two Cherenkov detector arrays (T0+) with a time resolution in the 20-50 ps range and a large, sectored scintillator ring (V0+). The T0+ arrays surround the beam pipe on both sides of the IP at a distance of 82 cm on the side of the muon arm, and 330 cm on the opposite side. In total, FIT will produce 208 Cherenkov signals and 48 scintillator signals, respectively.

The main goal of the FoCal proposal is to measure forward ( $3.5 < y < 5$ ) direct photons in pp, and p-Pb collisions to obtain unique experimental constraints on proton and nuclear PDFs in a new region of low  $x$  ( $10^{-5} - 10^{-6}$ ). In addition it provides measurements of neutral mesons, two particle correlations, and jets in p+p, p-Pb and (partially) in Pb-Pb. The direct photon measurement requires a new electromagnetic calorimeter with extremely high granularity. The design principle of the high-resolution SiW sandwich calorimeter will be presented and results from the ongoing R&D program with test beams will be shown. The detector will be instrumented with Si-pad sensors with analog readout and a MAPS-based digital pixel readout. The test beam results include linearity and energy resolution measurement, but also three-dimensional shower distributions on the sub-millimeter scale and the corresponding excellent position resolution.

## Content type

Experiment

## Collaboration

ALICE

## Centralised submission by Collaboration

Presenter name already specified

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