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ALICE Forward Calorimeter upgrade (FoCal): physics program and expected performance

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The FoCal is a high-granularity forward calorimeter to be installed as an ALICE upgrade during the LHC Long Shutdown 3 and take data in Run 4.

It will cover a pseudorapidity interval of $3.2 < \eta < 5.8$, allowing to explore QCD at unprecedented low Bjorken- x of down to $\approx 10^{-6}$ – a regime where non-linear QCD dynamics are expected to be sizable.

The FoCal consists of a compact silicon-tungsten sampling electromagnetic calorimeter with pad and pixel readout to achieve high spatial resolution for discriminating between isolated photons and decay photon pairs. Its hadronic component is constructed from copper capillary tubes with scintillator fibers.

The detector design allows measuring a multitude of probes, including direct photons, jets, as well as photo-production of vector mesons in ultra-peripheral collisions and angular correlations of different probes.

After the recent completed of the Technical Design Report (<https://cds.cern.ch/record/2696471>), the FoCal project is entering the production phase in view of installation in 2028.

We will give an overview of the FoCal physics programme, of the detector design and of its expected performance using results from recent test beams of small-scale prototypes.

Category

Experiment

Collaboration

ALICE

Primary authors: COLLABORATION, ALICE; OTWINOWSKI, Jacek Tomasz (Institute of Nuclear Physics Polish Academy of Sciences (PL))

Presenter: OTWINOWSKI, Jacek Tomasz (Institute of Nuclear Physics Polish Academy of Sciences (PL))

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