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A Forward Calorimeter in ALICE

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FoCAL is a high-granularity forward calorimeter to be installed as an ALICE upgrade subsystem during the LHC Long Shutdown 3 and take data during the LHC Run 4. It consists of a compact silicon-tungsten sampling electromagnetic calorimeter (FoCAL-E) with pad and pixel readout layers to achieve high spatial resolution for discriminating between isolated photons and decay photon pairs, and a hadron calorimeter based on copper capillary tubes read out using scintillator fibers (FoCAL-H) to improve the isolation energy measurement for prompt photons.

The FoCAL detector extends the ALICE physics programme with the capability, unique at the LHC, to investigate gluon Parton Distribution Functions (PDFs) down to Bjorken-x of ˜10ˆ-6 at a momentum transfer Q ˜ 4GeV/c, where these are expected to behave non-linearly due to the high gluon densities, with direct photon measurements. Additionally, FoCAL allows forward jet measurements in pp and p-Pb collisions, including gamma-jet and jet-jet correlations, but also photo-production of vector mesons such as the J/\psi in proton-Pb and Pb-Pb ultra-peripheral collisions.

In this presentation we will discuss projected detector performance studies for the main physics observables and results from the test beam campaigns in 2019 and 2021 at DESY and CERN, respectively.

Submitted on behalf of a Collaboration?

Yes

Author: ARSENE, Ionut Cristian (University of Oslo (NO))

Presenter: ARSENE, Ionut Cristian (University of Oslo (NO))

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