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A Forward Calorimeter in ALICE

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The Forward Calorimeter (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 and energy resolutions and a hadron calorimeter based on copper capillary tubes read out using scintillator fibers (FoCal-H).

The FoCAL detector extends the ALICE physics programme with the capability, unique at the LHC, of investigating gluon Parton Distribution Functions (PDFs) down to Bjorken-x of ˜10ˆ-6. In this kinematic range, the gluon distributions are expected to behave non-linearly. FoCal is optimized for reconstructing direct photons, however, other measurements are foreseen as well. In particular, FoCal will be able to measure the photo-production cross sections of vector mesons in a wide enegy range in photon-proton and photon-lead collisions, going to Bjorken-x values as low as a few 10ˆ-6.

In this presentation we will discuss projected detector performance studies for the main physics observables foreseen to be made with the data expected to be recorded during Run-4 with a focus on the photo-production measurements in p-Pb and Pb-Pb ultra-peripheral collisions.

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