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Conceptual design and performance simulations of super-compact electromagnetic calorimeter

Measurements of particle production at forward rapidities in high energy p-p, p-A and A-A collisions provide access to physics processes at very low Bjorken x. These measurements will allow to study the gluon saturation scale and improve our knowledge of parton distribution in nuclei.
Specific requirements must be fulfilled for a calorimeter to successfully operate in high-multiplicity forward region within often stringent space limits. Here we present a study of a conceptual design of super-compact electromagnetic calorimeter being developed at Czech Technical University in Prague. The design of the sampling calorimeter is based on a sandwich structure of thin tungsten and scintillator layers oriented in parallel to the beam. It is aimed for the detector to allow measuring of high energy photons (1<E<1000 GeV) in forward rapidities (2.5 <eta< 4). The used optical readout of individual scintillator pads guaranties the required high radiation hardness of the detector. We present simulation of the expected performance of the optical pad readout together with overall detector performance.

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