

Crylin: crystal calorimeter with longitudinal information for a future muon collider

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Modern tracking systems are very precise, therefore, in particle flow-like reconstruction algorithms, the jet performance is usually limited by the calorimeter. The need to solve the fat jet substructure favors the design of finely segmented calorimeters. However, this contrasts with the need to have high temporal resolutions for signal events even at low energy deposits: for example due to the passage of high-energy muons. Our proposal is a semi-homogeneous calorimeter based on Lead Fluoride (PbF₂) crystals with surface mounted UV extended Silicon Photomultipliers (SiPMs). This calorimeter can be segmented longitudinally as a function of the energy of the particles and the background level. A single module consists of longitudinal layers of crystal cells: each cell is composed of PbF₂ crystals of 10x10x40 mm³ coupled with an array of 4 SiPMs of 4 mm² areas, readout in series of 2. The realization and results on a small prototype of 2 layers with 3x3 crystals each, will be described.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

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