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Development of High-Granularity Dual-Readout Calorimeter with psec Timing

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High-precision detectors are crucial for the exploration of new physics. This research aims to develop a new excellent resolution and high granular calorimetry by integrating Dual-Readout and High-Granularity techniques, along with picosec timing resolution. Dual-Readout is to measure hadronic showers by Cherenkov light addition to scintillation light to simultaneously read two types of signals. By distinguishing between the electromagnetic and non-electromagnetic components in the hadron showers, energy can be reconstructed more accurately when using additional Cherenkov information. Moreover, High-Granularity with picosec timing resolution improves the identification of individual particles and reconstructs more accurate energy with best suited detectors depending on particle types. This study evaluates the overall resolution improvement of this detector equipped with these three technologies by simulation. This presentation will discuss the current state of optimizing detectors that combine Dual-Readout and High-Granularity.

Authors: GATTO, Corrado (INFN & NIU); JEANS, Daniel; OGAWA, Hiroyasu (The University of Tokyo); FREEMAN, Jim (Fermi National Accelerator Lab. (US)); MATSUOKA, Kodai (Nagoya University); KAMIYAMA, TAIKI (University of Tokyo); SUEHARA, Taikan (ICEPP, The University of Tokyo (JP)); TAKESHITA, Toru (Shinshu University (JP)); LI, WEIYUAN (The University of Tokyo); OOTANI, Wataru (ICEPP, University of Tokyo)

Presenter: KAMIYAMA, TAIKI (University of Tokyo)

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