38th INTERNATIONAL CONFERENCE ON HIGH ENERGY PHYSICS
AUGUST 3 - 10, 2016
CHICAGO

Contribution ID: **983** Type: **Oral Presentation**

Technologies for highly granular electromagnetic and hadronic calorimeters (12' + 3')

Thursday 4 August 2016 13:00 (15 minutes)

The CALICE collaboration is developing highly granular calorimeters primarily to establish those technologies for experiments at a future lepton collider optimized for particle flow event reconstruction. These technologies are now also finding applications in other areas, such as upgrades for the LHC. After the successful validation of the principle of imaging calorimeters with different electromagnetic and hadronic physics prototypes, the emphasis has now shifted to technological prototypes that address system issues relevant for full detector systems and production techniques amenable to mass production. At examples such as the SiPM-based Analog Hadron Calorimeter and the RPC-based Semi-Digital Hadron Calorimeter, we will discuss new developments on electronic integration, the fabrication of large size detector elements extending over several square meters and techniques for the mass production and assembly of scintillator tiles. We will also report results from recent beam tests of such elements, and give an outlook on the development towards combined beam tests of different CALICE technological prototypes integrated via a common DAQ system.

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Session Classification: Detector: R&D and Performance

Track Classification: Detector: R&D and Performance