

Track 3: Calorimeters

Today's micro-electronics integration enables the realisation of highly granular calorimeters with imaging capabilities. Scintillator tiles read-out by pixelated semi-conductor photo-sensors, so-called SiPMs, embedded in read-out electronics boards, constitute one of the promising imaging calorimeter technologies, used, e.g., in the upgrade of the CMS detector.

In this track students will work with SiPM-on-tile prototype calorimeter elements on the test bench and in the DESY test beam, and analyse their data. They will study basic properties of SiPMs as well as electromagnetic and hadronic showers.

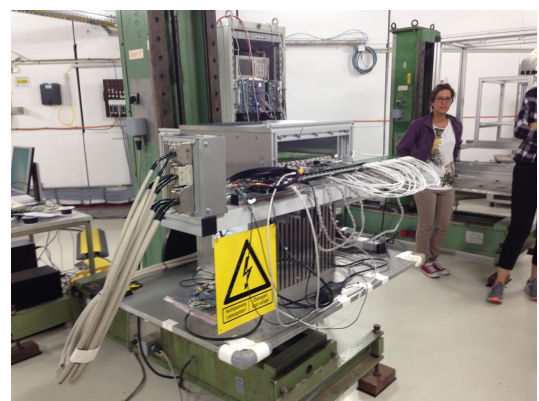
Task 1: SiPM spectra and gain measurement

Using flashes from a built-in LED system, the gain of SiPMs is measured and studied as a function of operating parameters.



Task 2: Beam tests of a SiPM-on-tile module

The readout module is exposed to minimum ionising particles (MIPs) and electromagnetic showers with various absorbers, for calibration and construction of a shower profile.



Task 3: Electromagnetic test beam data and shower shapes

Using event displays of test beam data taken with a stack at DESY and CERN, the variation of electromagnetic shower profiles with energy is studied.

Task 4: Hadron showers and interaction length

The hadronic interaction length of a prototype calorimeter structure and its dependence on energy is studied using the images of hadronic showers from test beam data.

