

CALICE Detectors

The physics requirements of a future TeV-scale e^+e^- machine such as the International Linear Collider (ILC) demand extremely high performance calorimetry. This is best achieved using a finely segmented system which reconstructs events using the so-called "particle flow" approach.

To demonstrate that the required performance of the calorimeter *system* can be achieved and that simulations (detector models and underlying physics models used by GEANT4) can reproduce measurements, the CALICE Collaboration is engaged in a co-ordinated series of R&D activities, combining all aspects of calorimetry for such a detector.

The most significant part of this project is a combined testbeam programme. CALICE has developed prototypes of the three main calorimetric subsystems (ECAL, HCAL, tail catcher/muon tracker) of a future detector, and is evaluating the performance of alternative technological solutions within this combined system. Information on each subsystem is given below.

- SCECAL - scintillator / steel ECAL design
- SiW ECAL - a 30 layer silicon tungsten sampling calorimeter, active 9760 channels, $24 X_0$ deep, approx. $20 \times 20 \times 30 \text{ cm}^3$
- MAPS ECAL - studies into a novel digital ECAL concept, using 50 micron pixel pitch, the "Tera-pixel" calorimeter

- AHCAL - the analogue HCAL physics prototype, scintillating tiles and SiPMs, 8184 channels, 1m^3
- US DHCAL - the digital HCAL, GEM or RPC readout
- SDHCAL - Semi Digital Gas HCAL (GRPC, MICROMEGAS)
- TCMT - Tail Catcher and Muon Tracker

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