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Introduction to CALICE

Who

The Calice Collaboration is R&D group of around 280 physicists and engineers from around the world, working together to develop new, high performance detectors for high energy e⁺e⁻ experiments.

The Collaboration is organised as follows:

- Spokesperson: Roman Pöschl, poeschl@lalNOSPAMPLEASE.in2p3.fr
- Steering Board
- Technical Board
- Speakers' Bureau
- Coordinators

Why

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.

How

To show that this *overall calorimeter system* performance 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 x 20 x 30 cm³
- 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, 1m³
- DHCAL🔗 - the digital HCAL, GEM or RPC readout
- TCMT - Tail Catcher and Muon Tracker

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