

# Study on Scintillator-Based EM Calorimeter

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Two types of lead/scintillator sandwich EM calorimeter (ECAL) test modules were constructed and tested with beams to evaluate performance of position and angle measurements as well as energy resolution and linearity. In the first design, scintillator plates are divided into  $4\text{cm}\times 4\text{cm}$  tiles where WLS fibers are embedded, while the second employs 1cm-wide scintillator-strip arrays to achieve finer granularity. In order to supplement granularity for the tile case, shower maximum detector was also tested which is composed of scintillator-strip arrays to which photon detectors are directly attached.

Two beam tests were carried out with electron beams at KEK in 2002 and at DESY in 2003. For the tile/fiber ECAL, calorimetric measurement was not made in these tests because only part of test modules was constructed. This will be done in the next beam test planned in 2004, with full thickness and new photon sensors.

In this talk, design of the test modules and results from the two beam tests are presented. In addition, progress on simulation study based on the scintillator-strip ECAL and future R&D plan are also given.