

An ECAL prototype for the PEBS detector.

The positron excess in cosmic rays recently reported by PAMELA has raised considerable interest. Possible interpretations are the presence of a nearby pulsar or the annihilation of exotic dark matter particles. The large acceptance PEBS detector (Positron Electron Balloon Spectrometer) is proposed to provide measurements of the electron and positron fractions for energies between 1 GeV and 1.8 TeV with an unprecedented statistical quality of the data. Together with a scintillating fibre tracker and a transition radiation detector, PEBS features an electromagnetic calorimeter consisting of sandwiched scintillating layers between W absorber plates. Each layer is made of a series of scintillating bars with a small cross section ($7.75 \times 3 \text{mm}^2$). Each scintillating bar is optically isolated and equipped with wavelength shifting fibres readout by silicon photomultipliers. Its very good energy resolution is essential for a good proton background rejection from the shower profile ($N_e/N_p = 10^{-4}$ at 100 GeV). A small scale ECAL prototype (with Pb absorber) has been build and tested at CERN in November 2009 and results on the shower profile measurements and comparison with the simulation will be presented.

Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):

http://lphe.epfl.ch/~zehr/Zehr_PebsECAL_Vienna2010.pdf

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