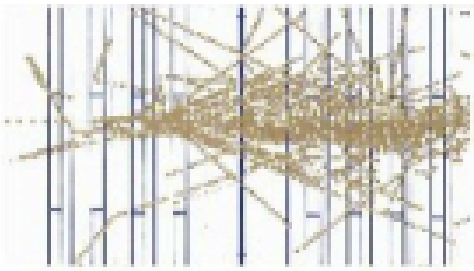

ID contributo: **99** Tipo: **oral presentation**

Construction and tests of a fine granularity lead-scintillating fibers calorimeter

martedì 27 maggio 2008 11:10 (20 minuti)

Summary

We present a fine granularity development of the KLOE lead-scintillating fibers calorimeter. A 23x15x55 cm^3 prototype, made of 200 grooved lead foils, 0.5 mm thick, glued with scintillating fibers at 1.35 mm pitch, has been instrumented on one side with an array of 3x5 light guides and PMTs each covering a 4.2x4.2 cm^2 cells, while on the opposite side the granularity has been increased by a factor of 16 by means of small light guides and multianode photomultipliers. Scintillating light is collected on the calorimeter side surface in 1.05x1.05 cm^2 cells, corresponding to about 64 scintillating fibers, by means of truncated pyramid light guides made of UV trasparent material (Bicron BC800), and is driven to 16 anode PMTs (Hamamatsu R8900-M16) with an area reduction factor of 4. A total of 240 readout pixels is obtained in this way, making of this detector a real tracking calorimeter.
Each multianode PMT corresponds to a single anode PMT on the opposite calorimeter side. Also, the first raw is equipped with high quantum efficiency multianode PMTs. Each multianode provide also an OR of the 16 last dynodes which can be udes for triggering. A dedicated electronic to collect and amplify the multianode signals has been developed. Signals are then split, summed to make trigger patterns and digitalized in ADCs and TDCs using the standard KLOE calorimeter electronic chain.
Here we describe the construction details, the measurement of the multianode PMTs response and intrinsic cross talk using a ps laser pulse, the measurement of the optical cross talk between adjacent light guides using the same laser to illuminate single scintillating fibers on the side opposite to the readout, and finally a cosmic ray test of the full device. A first comparison of cosmics data with a detailed simulation of the detector based on the FLUKA code is also possible.

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