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Spatial resolving SiPM-detector for cosmic muons

A scintillation detector with two-dimensional position resolution of a few mm and Silicon-Photo-Multiplier (SiPM), usable for large area trigger applications with few readout channels, is presented.

Position resolution in one direction is achieved by combining two trapezoidal shaped plastic scintillators to form one rectangular shaped scintillator rod. Each trapezoid in a rod is optically insulated against the other. The amount of light produced by incoming particles is proportional to their path length in the trapezoid and thus position dependent. The position resolution along the scintillator rod is determined by the propagation time of light. In both trapezoids the scintillation light is collected by wavelength shifting fibers (WLS-fibers) and guided to SiPMs, where the light output is detected. The SiPM of each trapezoid is located on opposite sites of the scintillator rod. This detector is designed for large area applications with only few readout channels, whereby areas of a square meter are achieved by combining several scintillator rods.

In this talk we present results of measurements on the performance of this new kind of two-dimensional spatially resolving trapezoidal scintillator detector.

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