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Systematic Study of a SiPMT array readout for fast time-of-flight detectors

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Array of SiPMTs may be used, in place of fast conventional photomultipliers (PMTs), for the readout of scintillator based time-of-flight systems. These new detectors are insensitive to external magnetic fields, have lower cost than traditional PMTs and present a compact design. Comparison of the obtained timing resolutions as respect to the baseline one (~ 50 ps) obtained with Hamamatsu R4998 PMTs are reported. Results using arrays from Hamamatsu, SenSL, Advansid will be shown.

Tests were done in laboratory both with cosmics and an home developed laser system, based on a fast Avtech pulse and a Nichia laser-diode, capable of simulating the signal from a MIP.

Up to four scintillator detectors were testes in parallel, distributing the light signal using a fused fiber splitter.

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