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Development of the SHiP Timing Detector Based on Scintillating Bars Readout by SiPMs

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The SHiP experiment (Search for Hidden Particles) is a new general purpose fixed target experiment proposed at the CERN SPS accelerator. A dedicated beam line in the North Area will be aimed at a fixed target station, followed by a magnetic shield to reduce beam induced background. The facility will comprise a compact tau neutrino detector and a detector to search for hidden particles. Background rejection is ensured by use of background taggers and a dedicated timing detector. The timing detector is used to reduce combinatorial di-muon background by requiring incoming particles to be coincident in time within 100 ps. One option for the timing detector consists of columns of horizontal scintillating bars read-out on each end by Silicon Photomultiplier (SiPM) arrays. This study includes characterization of SiPMs from different manufacturers to be used in the timing detector as well as results of time resolution measurements of EJ-200 and EJ-230 plastic scintillating bars read-out on both ends by SiPMs.

TRACK

Applications

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