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The ASACUSA scintillating fiber tracker: commissioning and characterisation

The goal of the FAST (Fiber Antiproton Scintillating Tracker) detector is the measurement of the annihilation cross section of slow antiprotons in gaseous targets in the ASACUSA beam line at the Antiproton Decelerator (CERN). The tracker will allow to reconstruct the charged pion tracks to identify the annihilation vertices. The detector, designed to cover a 50 cm long 15 cm radius cylindrical volume, consists of 2 axial and 4 stereo layers of scintillating fibers, readout by 42 multianode PMTs (64 channels each). 1 mm BCF-10 fibers have been used, for a total of 2688 readout channels. A custom designed electronic chain performs the signal amplification, discrimination and the digital sampling with a 640 MHz clock over a 800 ns gate. To test the detector performance before the commissioning on the ASACUSA beam line a cosmic ray run with an external trigger system and a reference silicon tracker has been done, collecting a total of 10 5 events. This work will describe the operation of the FAST detector during the cosmic ray tests and the results of the track reconstruction analysis in terms of efficiency and spatial and time resolution.

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