



ID contributo: 28

Tipo: non specificato

RSD2 performances in the AIDAINNOVA SPS test beam

mercoledì 21 febbraio 2024 09:50 (20 minuti)

In this work, we present a detailed study of the spatial and temporal resolution of Resistive Silicon Detectors (RSD) with cross-shaped electrodes, measured using a high-energy protons/pions beam at CERN SPS, within the AIDAINNOVA collaboration. The tested RSD2 sensors, fabricated by FBK, have relatively large pixel sizes (1300 and 450 microns pitch) and innovative read-out electrode layouts geared toward reaching a uniform response over the whole surface.

The sensors performance was measured by reconstructing the tracks of 120 GeV pions/protons impinging on the devices, using the MIMOSA tracker and the Corryvreckan software package. The employed electronics is a low-noise discrete readout board specifically developed for LGAD testing: the Chubut2.

The results of such measurements yield excellent position resolution, about 20 μm for the 450 microns-pitch sensor, and time resolution typical of the LGAD technology. We will present a comparison with the resolutions obtained in the laboratory using the TCT setup, that highlights the various contributions to the temporal resolution.

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Classifica Sessioni: LGAD 1