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Beam test results for the SuperB SVT thin striplet detector

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The SuperB Silicon Vertex Tracker will be made of 5 layers of double sided silicon strip sensors plus an additional innermost layer (Layer0) at a radius of about 1.5 cm, very close to the beam pipe.

For the first phase of the experiment the baseline option for the Layer0 is a high resistivity thin (200 μm) double sided silicon detector, with short strips (”Striplets”) at 45° angle to the detector’s edge.

This design allows lower material budget compared to standard strip detectors. Moreover, the strips are shorter than in standard designs; this reduces the average occupancy per channel and compensates for the increased strip-to-back capacity.

In September 2011 Striplets were tested in a 120 GeV/c pion beam at the CERN SPS.

In the following we present the beam test results on striplet sensors readout by the FSSR2 chip, the second release of the Fermilab Silicon Strip Readout chip, originally designed for the silicon strip detectors of the BTeV experiment.
We report here experimental results on efficiency and spatial resolution achieved as a function of the incidence angle up to 70°.

for the collaboration

On behalf of the SVT-SuperB Group.

Primary author: FABBRI, Laura (INFN - Bologna)

Presenter: FABBRI, Laura (INFN - Bologna)

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