

Beam test results of a monolithic pixel detector designed in SOI 200nm technology.

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For tracking detectors at future linear colliders a high-precision position measurement is required. In order to limit multiple scattering, a detector with low material budget is advantageous. Monolithic structures represent a promising solution for such detectors. This work presents the test beam results of pixel detectors fabricated in Lapis 200 nm Silicon-On-Insulator (SOI) CMOS technology. The SOI prototypes were tested in Summer 2017 - at CERN's SPS H6 beam line with 120 GeV pion beams using a Timepix3 telescope as a reference.

Two wafer types with different resistivity and detector thickness were tested: Floating Zone type n and Double SOI type p. Moreover, the measured matrix consists of two different pixel types, one based on charge preamplifier architecture and one based on source-followers. The data was analysed in terms of spatial resolution and detector efficiency. The analysis chain included pedestal and noise calculation, different cluster reconstruction algorithms, as well as alignment and eta correction. The preliminary results give a resolution of about $2.5 \mu\text{m}$ for $30 \mu\text{m}$ square pixel pitch.

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