

Resistive readout in silicon detectors

Abstract

In this seminar, I will present the implementation of the resistive readout principle to the silicon detector. Resistive Silicon detectors are a new kind of silicon detector that uses the combination of a continuous resistive readout electrode with AC readout to share the signal among pads. In this design, the signal is collected on a continuous resistive electrode, and it is AC-coupled to pixel electronics. This technique leads naturally to signal sharing among pads, even in very thin sensor and without an external magnetic field.

Our prototypes have shown that resistive readout works remarkably well, and, using the shared signals, the position resolution is extremely good (3-5 μm), even with large pads (200-300 μm).

These new sensors, combining internal gain and internal sharing, provide very good temporal resolution ($\sim 30\text{-}40\text{ps}$), have 100% fill factor, and are very thin ($\sim 30\text{-}50\ \mu\text{m}$).