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## 4D particle tracking with Resistive AC-Coupled Silicon Detectors

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In this contribution we present the advantages of performing 4D particle tracking with Resistive AC-Coupled Silicon Detectors (RSD), a new paradigm in silicon detectors with moderate internal multiplication. Their design is an evolution of the standard LGAD (Low-Gain Avalanche Diode) technology, and is based on the combination of a resistive  $n$ -implant, freezing the multiplied charges, and a capacitive oxide layer, coupling the signal with the readout pads. Having a homogeneous gain layer throughout the detector, the spatial granularity is realized through the segmentation of pads, while the timing information directly benefits from the good performances given by the internal multiplication. Such scheme will allow to completely eliminate the signal loss between active areas (or pixels) proper of LGAD-based silicon trackers and to fully exploit the potentialities of high-luminosity scenarios foreseen in near-future colliders, thanks to their intrinsic 100% fill-factor (the ratio between the active and the total area).

After reviewing the RSD working principle and their design through numerical simulations, also a set of laboratory characterizations performed on the first production run RSD1 at Fondazione Bruno Kessler (FBK) will be presented, both before and after irradiation.

**Primary authors:** MANDURRINO, Marco (INFN); ARCIDIACONO, Roberta; BOSCARDIN, Maurizio; CARTIGLIA, Nicolò (INFN); DALLA BETTA, Gian Franco; FERRERO, Marco; FICORELLA, Francesco; PANCHERI, Lucio; PATERNOSTER, Giovanni; SIVIERO, Federico; SOLA, Valentina; STAIANO, Amedeo; VIGNATI, Anna

**Presenter:** MANDURRINO, Marco (INFN)

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