



Contribution ID: 22

Type: Oral

The Pentadimensional Tracking Space Detector, R&D for spaceborne LGAD Si-microstrip trackers

Tuesday 13 May 2025 16:55 (25 minutes)

In the context of the Pentadimensional Tracking Space Detector project (PTSD), we are currently developing a demonstrator to increase the Technological Readiness Level of LGAD Si-microstrip tracking detectors for applications in space-borne instruments.

Low Gain Avalanche Diodes (LGAD) is a consolidated technology developed for particle detectors at colliders which allows for simultaneous and accurate time (<100 ps) and position (~ 10 μm) resolutions with segmented Si sensors. It is a candidate technology that could enable for the first time 5D tracking (position, charge, and time) in space using LGAD Si-microstrip tracking systems. The intrinsic gain of LGAD sensors may also allow to decrease the sensor thickness while achieving signal yields similar to those of Si-microstrips currently operated in Space.

In this contribution we discuss the ongoing activities for the design, development, and test of a breadboard laboratory model for verification of requirements, functionalities and space qualification of LGAD Si-microstrip devices for 5D tracking in space.

Eligibility for "Best presentation for young researcher" or "Best poster for young researcher" prize

No

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Session Classification: R&D of novel approaches and instruments