

Si-microstrip LGAD detectors for cosmic-ray space-borne instruments

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In the context of the PTSD project, we are currently developing a demonstrator to increase the Technological Readiness Level of LGAD Si-microstrip tracking detectors. 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 possible applications and breakthrough opportunities in next generation large area cosmic-ray detectors and sub-GeV gamma-ray detectors that could be enabled by LGAD Si-microstrip tracking detectors in Space. We are currently developing a demonstrator to increase the Technological Readiness Level of LGAD Si-microstrip tracking detectors. We also propose the design of a cost-effective instrument to be deployed on a CubeSat platform to enable and qualify the operations of LGAD Si-microstrip detectors in Space.

Collaboration

Role of Submitter

I am the presenter

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