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Opportunities of Si-microstrip LGAD for next-generation Space detectors

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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 ($< 10 \mu\text{m}$) resolutions with segmented Si-pixel sensors. It is a candidate technology that could enable for the first time 4D tracking (position 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 propose the design of a cost-effective instrument demonstrator on a CubeSat platform to enable and qualify the operation of LGAD Si-microstrip detectors in Space.

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