



## **Low power hard-rad electronics for particle detection in space plasmas**

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Particle detection in highly-radiative environment is one of the experimental challenges of planetary exploration. We present the design and performances of a compact electron detector that takes advantage of the development of a hard-rad and ultra low-power front-end electronics. The Applied Specific Integrated Circuit (ASIC) consists of charge sensitive amplifiers and discriminators allowing a 4.5MHz periodic counting rate. The 16-channels ASIC only takes 30mW of power which is the power budget of single channel hybrid components with similar performances. Each channel can be independently configured in order to adjust the detection threshold of the discriminator. An internal test circuitry is used to monitor the behavior of the electronics. This component, that has been tested at high ionizing doses, is immune to Single Event Latchups up to at least 80 MeV.cm<sup>2</sup>/mg and it will fly on the Solar Orbiter ESA mission.