

pSLIDER32: a 32 channels mixed-signal processor for the GAPS Si(Li) Tracker

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This work describes the first experimental results from the characterization of a 32 channels mixed-signal processor developed for the readout of lithium-drifted silicon, Si(Li), detectors of the General AntiParticle Spectrometer (GAPS) experiment to search for dark matter. The instrument is designed for the identification of antideuteron particles from cosmic rays during an Antarctic balloon mission scheduled for late 2021.

A full custom integrated circuit, named pSLIDER32 (32 channels Si-LI DEtector Readout ASIC prototype), has been produced in a commercial 180 nm CMOS technology. The ASIC is comprised of 32 low-noise analog readout channel featuring dynamic signal compression to comply with the wide input range, an 11-bit SAR ADC and a digital back-end section which is responsible for channel setting and for sending digital information to the data acquisition system (DAQ). The circuit design criteria and the first experimental results will be presented at the conference.

Funding information

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