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P1.18: The BEAR chip prototype: Design and experimental results

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This work presents the Boston Extended Amplitude Range (BEAR) ASIC that has been designed to work with ACSEPT (A Compact Solar Energetic Particle Telescope), a NASA funded solar energetic particle (SEP) telescope made up of a stack of 10 solid state detectors (SSD). Detailed characterization of ion species over wide energy ranges is required to understand the physics of generation, energization, and transport of SEPs. The BEAR ASIC is a single channel front-end, with 2 switchable capacitors sharing the charge deposited by SEPs at the input of the charge sensitive amplifier (CSA) thereby increasing the detectable energy range of SEP. The BEAR chip was designed to detect input energies of 0.5MeV to about 3GeV. The chip was fabricated using 130nm CMOS technology and, is currently being tested. We will present the design, simulation, and experimental results of the BEAR chip.

Primary authors: ANTONY GOMEZ, Ashley (Boston University); M.WALSH, Brian (Boston University); W. KNEPPER, Ronald (Boston University); G. KANEKAL, Shrikanth (NASA Goddard Space Flight Center)

Co-authors: SUAREZ, George (NASA Goddard Space Flight Center); J. DUMONTHIER, Jeffery (NASA Goddard Space Flight Center)

Presenter: ANTONY GOMEZ, Ashley (Boston University)

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