

Abstract Submitted
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Overview and initial results from the ANITA HiCal Experiment¹

JESSICA STOCKHAM, University of Kansas, ANITA COLLABORATION — The ANtarctic Impulsive Transient Antenna (ANITA) is a balloon-borne apparatus that surveys the Antarctic ice looking for radio signals produced by ultra-high energy (UHE) neutrinos and cosmic rays. Neutrino signals originating from shower events in the ice and cosmic ray signals originating from shower events in the atmosphere arrive at ANITA after being, respectively, transmitted through or reflected from the ice surface. Since these signals interact with the air-ice interface, it is important to understand the impact of the transmission or reflection on the signal, specifically decoherence caused by surface roughness, in reconstructing the properties of the initial UHE particle. HiCal is a calibration pulsing unit employing a piezo-electric sparking device coupled to a dipole antenna that transmits a UHE-like impulsive signal. The first HiCal payload was launched on a second balloon in conjunction with ANITA-III, with the objective of transmitting pulses that would be received by ANITA both directly and as signals reflected from the ice surface. A ratio of the amplitudes of reflected to direct signals would provide a direct measurement of any decoherence effects caused by surface roughness. The design, testing, and initial results from the first HiCal flight will be discussed.

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