

Implementing a Low-Threshold Analysis with the Askaryan Radio Array (ARA)

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The Askaryan Radio Array (ARA) is a ground-based radio detector at the South Pole designed to capture Askaryan emission from ultra-high energy neutrinos interacting within the Antarctic ice. The newest ARA station has been equipped with a phased array trigger, in which radio signals in multiple antennas are summed in predetermined directions prior to the trigger. In this way, impulsive signals add coherently, while noise likely does not, allowing the trigger threshold to be lower than a traditional ARA station. In this talk, I will discuss our ability to analyze these low-threshold events, using data from the 2019 season to illustrate new analysis techniques that yield high efficiency for low-SNR signals. I will also discuss how these analysis techniques could be applied to next-generation radio detectors.

Keywords

neutrino; radio; low threshold; Askaryan; Antarctica; analysis; Askaryan Radio Array; ARA; phased array;

Collaboration

other (fill field below)

other Collaboration

ARA

Subcategory

Experimental Results

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