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Using Multipath Radio Signals in an Ultra-high-energy Neutrino Detector S. MCCARTHY, Grinnell College, M. BEHELER-AMASS, A. KARLE, J. KELLEY, R. KHANDELWAL, M.-Y. LU, UW-Madison, ARA COLLABORATION — Ultra-high energy (UHE) neutrinos, such as those from cosmic-ray interactions with the cosmic microwave background, can reveal information about UHE processes in the Universe. The Askaryan Radio Array (ARA) is a neutrino detector currently under construction at the South Pole searching for such UHE neutrinos. ARA uses antennas in the ice to search for radio signals resulting from neutrino interactions. Because of the variable index of refraction in the ice, these radio pulses can reflect or refract off of the surface. We present simulations of how the inclusion of this additional pulse may improve the event reconstruction and discuss the implications for future detector designs.

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