

The hybrid detector stations of the IceCube surface array enhancement

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The IceCube Collaboration plans to upgrade IceTop, the surface array located on the South Pole glacier, with scintillation detectors augmented by radio antennas. The enhancements will help measure and mitigate the effects of snow accumulation on the IceTop tanks, as well as improve the measurements of high-energy cosmic rays. The enhancements also provide R&D experience for the next generation (IceCube-Gen2) detectors.

A full prototype station was installed near the center of the IceTop array during season 2019/20. The station features custom-designed DAQ electronics and consists of three radio antennas and eight scintillation detectors, each read out by a silicon photomultiplier (SiPM).

This talk will focus on the DAQ and detector R&D, calibration methods, and the results from operation of the prototype station. Future plans for instrumenting the entire IceTop array with hybrid stations will be presented.

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