

Characterisation and pre-calibration of the scintillation detectors of the IceTop surface enhancement

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The IceCube Collaboration plans to upgrade IceTop with scintillation detectors augmented by radio antennas. A full prototype hybrid station was installed near the center of the IceTop array.

The station features custom-designed DAQ electronics and consists of three radio antennas, sensitive in the MHz region and eight scintillation detectors, each having an active area of $1.5 m^2$ plastic scintillators, coupled via wavelength-shifting fiber and read out by a Silicon Photomultiplier (SiPM). The enhancements also provide R&D experience for the next generation (IceCube-Gen2) detectors.

This talk will focus on the necessary characterisation and calibration measurements of the scintillation detector components before they are assembled and will explain the methods to define the efficiency and performance of the scintillators before deployment at the South Pole. In addition, it will be shown how the determination of the temperature-sensitive operational parameters is realized in the lab as contribution for enabling a temperature-independent and therefore homogeneous detector array, realized by control loops.

Primary author: HUBER, Thomas (Karlsruhe Institute of Technology)

Presenter: HUBER, Thomas (Karlsruhe Institute of Technology)

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