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The South Pole Acoustic Test Setup SPATS.

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New detection techniques for Ultra-Hight Energy (UHE) neutrinos are required for instrumenting a large detector volume needed to observe the expected low neutrino fluxes at energies of EeV or above. To measure these low fluxes, studies on a larger IceCube neutrino observatory at the south pole have been intensively investigated in the last decade. These studies have introduced a hybrid detection concept including radio and acoustic detection techniques combined with the existing optical array. This hybrid configuration would allow for a larger sensitive volume at reasonable cost with high sensitivity and low background.

The feasibility of an acoustic neutrino detection array at the South pole depend upon the acoustic properties of the ice such as the attenuation length, sound speed, background noise level and transient rate. The South Pole Acoustic Test Setup (SPATS) has been developed and deployed to evaluate in-situ the acoustic properties of the South Pole ice in the 10 to 100 kHz frequency range. The SPATS array consists of four vertical acoustic strings deployed in the upper 500 meters of the Antarctic ice cap. Each string has seven stages and each stage is equipped with one transmitter and one sensor module. A retrievable transmitter was used in 10 drill holes to collect data at a range of distances up to approximately 1 kilometer. The latest SPATS results are presented.

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