

Development of an acoustic sensor for the future IceCube-Gen2 detector for neutrino detection and position calibration

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In the planned high-energy extension of the IceCube Neutrino Observatory in the deep ice at the geographical South Pole the spacing of detector modules will be increased with respect to IceCube. Because of these larger distances the quality of the optical geometry calibration is expected to deteriorate. To counter this an independent acoustic geometry calibration system based on trilateration is introduced. Such an acoustic positioning system (APS) has already been developed for the Enceladus Explorer Project (EnEx), initiated by the DLR Space Administration. In order to integrate such APS-sensors into the IceCube detector the power consumption needs to be minimized. In addition, the frequency response of the front-end electronics is optimized for positioning as well as the acoustic detection of neutrinos. The new design of the acoustic sensor and results of test measurements with an IceCube detector module will be presented.

Summary

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