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A co-deployed dust-logging instrument for the IceCube Upgrade and IceCube-Gen2

A precise understanding of the optical properties of the instrumented Antarctic ice sheet is crucial to the performance of optical Cherenkov telescopes such as the IceCube Neutrino Observatory and its planned successor, IceCube-Gen2.
One complication arising from the large envisioned footprint of IceCube-Gen2 is the larger impact of the so-called ice tilt. It describes the undulation of ice layers of constant optical properties within the detector.
In this contribution, we will describe the project to build a co-deployed laser dust logger. This is a device to measure the stratigraphy of impurities in the ice to derive the ice tilt. It consists of a light source that will be co-deployed with the photosensor modules, meaning it is part of the deployment string and operated during the deployment of the detector. The newly developed device will be tested during the deployment of the IceCube Upgrade in the 2025/26 austral summer to pave the way for IceCube-Gen2.

Collaboration(s)

IceCube

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