

Deployment of the IceCube Upgrade Camera System in the SPICEcore hole

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What is this contribution about?

- One IceCube upgrade camera was integrated into a logger device to measure the properties of the Ice surrounding the South Pole ice core (SPICEcore) hole near the geographic south pole
- The logger was also equipped with an LED that emitted light into the ice
- From the backscattered light captured in the camera the scattering length in the ice can be estimated

Why is it relevant / interesting?

- This test allows to measure the optical properties of the south pole ice that can help refining IceCube ice models to improve

What has been done?

- During the 2019/2020 winter season the was deployed at the SPICEcore hole for a total of 10 hours on December 21st
- The logger made stops at depths of 500 m, 810 m, 761050 m, 1400 m, 1490 m, 1610 m and 1670 m at both descent and ascent
- The image brightness was compared to measurements with the laser-based dust logger to test the capability to gauge the optical properties of the ice.
- Simulations based on the current IceCube ice model were run to estimate the image brightness at various depths

What is the result?

- The capability of the system to measure the optical properties of the Antarctic ice was demonstrated with a simple analysis method.
- A future analysis should be able to provide independent data on the scattering and absorption parameters of the ice that is complimentary to existing logger data.

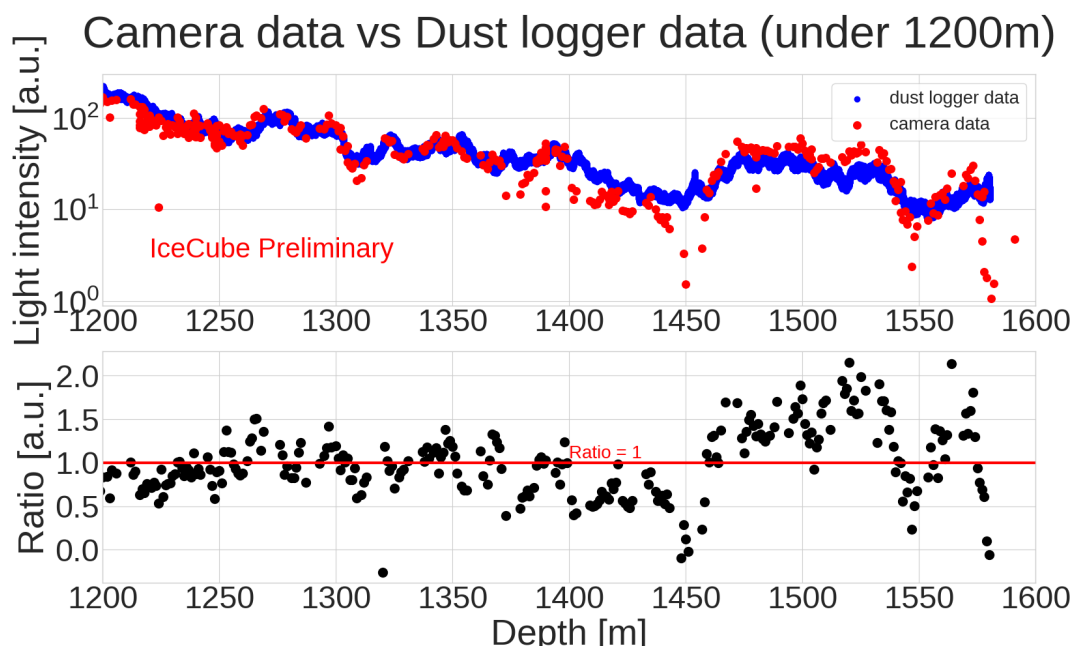


Figure 1: The dust logger and the camera brightness data as a function of depth.