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The Greenland Telescope – Thule Extended Operations

Friday, 10 September 2021 13:00 (15 minutes)

I will report the progress and the status of the Greenland Telescope in Thule, Greenland. The telescope was commissioned in the spring of 2018, and it had since participated in the global VLBI observation campaign in millimeter and submillimeter wavelengths. The GLT has been a partner station in the Even Horizon Telescope since 2018 for the 230 GHz VLBI observation. In 2021, we have also confirmed the fringe detection with ALMA at 345 GHz. Besides the science observations, the operations in Thule allow us to test many new functions, especially those designed to protect the hardware from the harsh cold environment of the GLT before the telescope is deployed to its final destination near the summit of Greenland. The GLT is to achieve two primary scientific goals: To image/study the shadow of the supermassive black hole in M87 [1] and conduct astronomy research in terahertz frequencies. Since the 12-m ALMA North America Prototype Antenna was awarded to our team, the Academia Sinica Institute of Astronomy & Astrophysics (ASIAA) and the Smithsonian Astrophysical Observatory have entirely rebuilt the antenna from the ground up for operation in the extreme arctic conditions of northern Greenland [2]. The Thule site is our first staging area before moving to Greenland's high site, and we have conducted a comprehensive set of technical tests on the telescope in Thule. We have attained the first light at 230 GHz at the end of 2017 and subsequently participated in global VLBI observations at 86 GHz and 230 GHz. While conducting system verifications and some specific science observations, we have explored and studied moving the antenna to its final destination. The final stage of the project will bring the antenna and equipment 1100 km inland to the 3216m summit of the Greenland ice sheet, where the antenna will be reassembled, tested, and commissioned to take advantage of the arid climate and the northern latitude.

Credits:

The Greenland Telescope Project is led by the Academia Sinica Institute of Astronomy and Astrophysics and the Smithsonian Astrophysical Observatory

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