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After rock slope failures in the Karrat fjord of West Greenland led to a tsunami with catastrophic consequences for nearby settlements, there has been an increased focus on rock slope related geohazards in Greenland. As part of these efforts, the Thawing Mountains project aims to improve our understanding of the thermal regime and permafrost distribution in rock slopes in the Vaigat area of central West Greenland. In this talk we present the first experiences from a completely off-grid, solar powered Electrical Resistivity Tomography (ERT) system, installed in the summer of 2021 on a basaltic plateau and vertical rock face, to collect time-lapse resistivity and IP data. The purpose of the experiment is to assess the feasibility of operating such a system under remote, high-Arctic field conditions, to obtain insight into the resistivity-temperature relationship for the basaltic rocks in the region, and to evaluate to which extent such resistivity and IP datasets are useful in the evaluation of freeze-thaw processes in the rock mass.

The field site is located on the North-East coast of Disko Island, on a plateau at approximately 1000 m elevation. The established profile has a total length of 160 m, with the first approximately 30 m installed down a vertical rock face. Electrodes are equidistantly spaced 2 m apart and consist of expansion bolts with a bentonite slurry to improve contact. The instrumentation is powered by solar panels with a total rating of 960 Wp connected to a battery bank of 550 Ah. The station measures daily profiles during summer, but is scheduled to gradually reduce measurement frequency over the fall as daylight becomes scarce. Basic results and health data is transmitted from the station regularly over a cellular connection which also allows modification of collection settings. However full data download will only occur upon station visits.