



## **Detection and spectral characterization of calving related seismic signals, Helheim Glacier, South East Greenland**

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Seismogenic signals associated with calving and ice rupture in the large outlet glaciers in Greenland can provide new and valuable information about the cryospheric processes involved. Teleseismically detected glacial earthquakes are found at Helheim Glacier to be preceded by long duration rumblings with a characteristic frequency content distinctively different from both tectonic earthquakes and the background noise. These rumblings have an average duration of 28-29 minutes and have high-frequency as well as low-frequency content. We have developed a frequency-domain detection algorithm for the rumblings recorded at the BB station ISOG, located ca. 100 km from the glacier. The seismic detector has been calibrated with observations of calving from a time lapse camera near the glacier front. Our analysis shows a seasonal variation in the occurrence of rumblings with a peak in mid-September coinciding approximately with the end of the melt season.