



## **The mantle transition zone and the upper mantle in Central-Eastern Greenland**

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We present a receiver function (RF) study of the mantle transition zone (MTZ) and upper mantle in central-eastern Greenland. Our results are based on data from 18 temporary broad-band seismometers and 5 additional stations from the GLISN and GLATIS networks. The stations were operating in the region between Scoresby Sund and Summit ( $\sim 70^\circ$  N) with half of them installed on ice, the other half on bedrock.

For our analysis we calculated low frequency PRF and SRF, which use the difference in travel times between converted and not converted phases at discontinuities. We see clear signals from P410s and P660s in most of our PRF and from S410p in the SRF. Their delay times suggest a surprisingly thin MTZ for most parts of the study area with up to 25 km of thinning compared to standard Earth models. The only exception is a small region in the centre of the study area, which shows times close to standard. It is mainly the delay time for P410s, that varies, while P660s is stable throughout our study area. This indicates, that the thinning of the MTZ is mainly due to topography on the 410-discontinuity.

We furthermore observe an M-shaped signal for P410s at stations in the western part around Summit. A similar, complicated signal has been observed previously in different settings and is interpreted as a thin low velocity layer between 410 km and 520 km.

In addition we jointly inverted the PRF and SRF for upper mantle velocities. These results show velocities slower than IASP91 for the entire study area.

Both the low velocities in the upper mantle and the thinning of the MTZ are in contrary to simple models of old continental shields and might indicate a fairly recent heating event.