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Supplementary information

Multiple subglacial water bodies below the south pole of Mars unveiled by new MARSIS data

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Multiple subglacial water bodies below the South Pole of Mars unveiled by new MARSIS data

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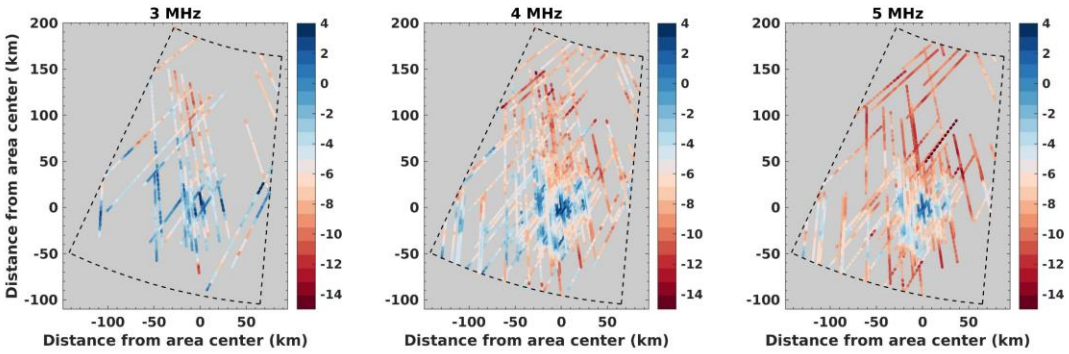
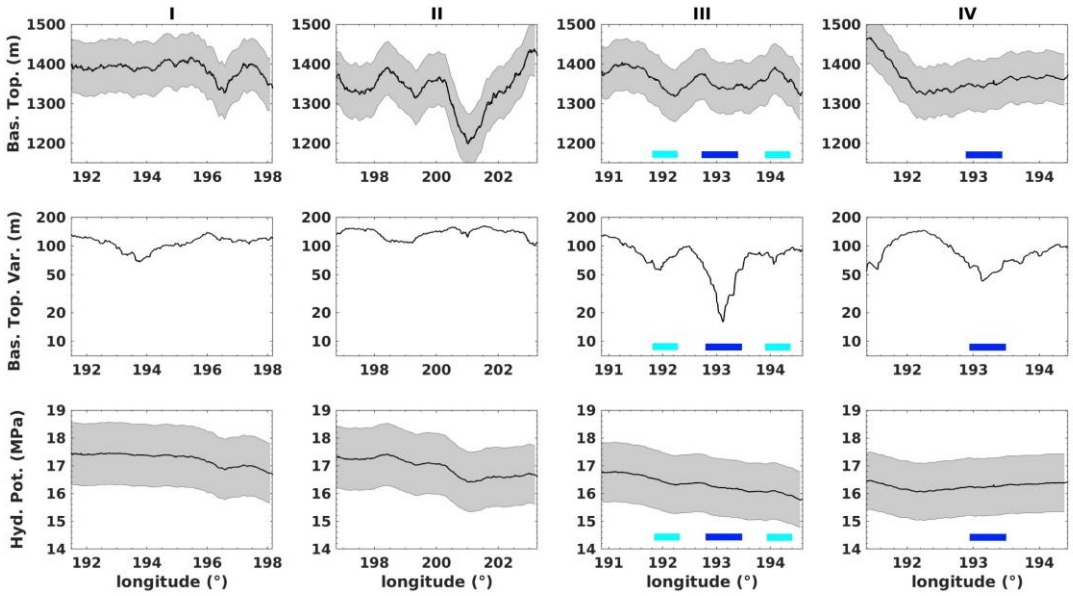
Supplementary Figures 1 - 6

Supplementary Figure 1



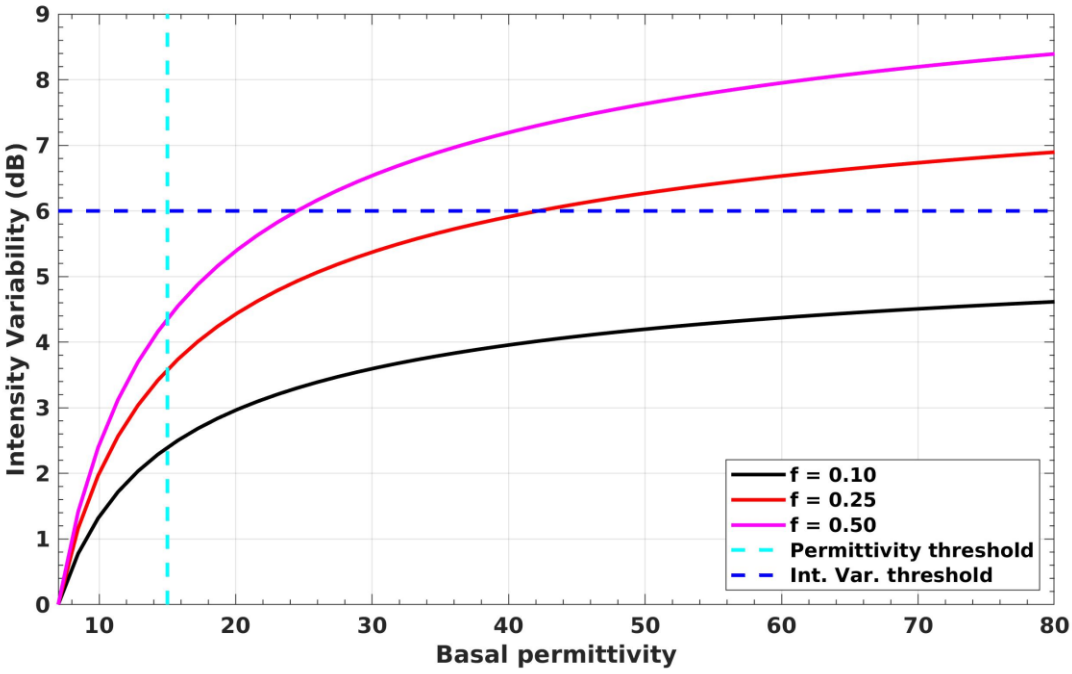
Normalized basal reflectivity maps of the observations collected in the investigated area (185°-205°E and 79.5°-84.1°S) at 3, 4 and 5 MHz.

Supplementary Figure 2



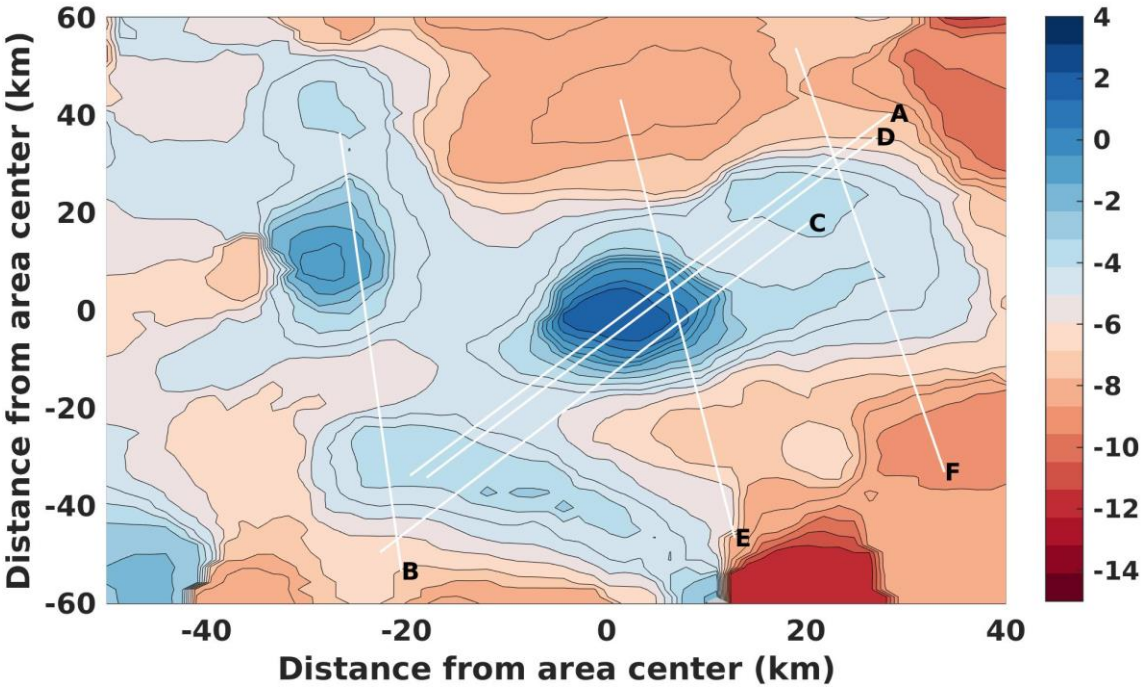
Top row indicates the basal topography with the associated uncertainty (gray band). The central row represents the basal topography variability, computed as the standard deviation of the basal topography, applying a moving average window (Eq.1), which shows local minima in correspondence to the main body of water (dark blue lines). Bottom row represents the hydraulic potential with relevant uncertainty (gray band). The first two columns refer to the observations collected outside the bright area and the last two those collected inside the bright area. Dark blue lines indicate the position of the main body of liquid water, cyan lines the lateral water patches. In the wet areas the along-track variations of basal topography and hydraulic potential are of the same order of magnitude as the uncertainties, indicating that MARSIS does not have the sensitivity to measure such variations.

Supplementary Figure 3



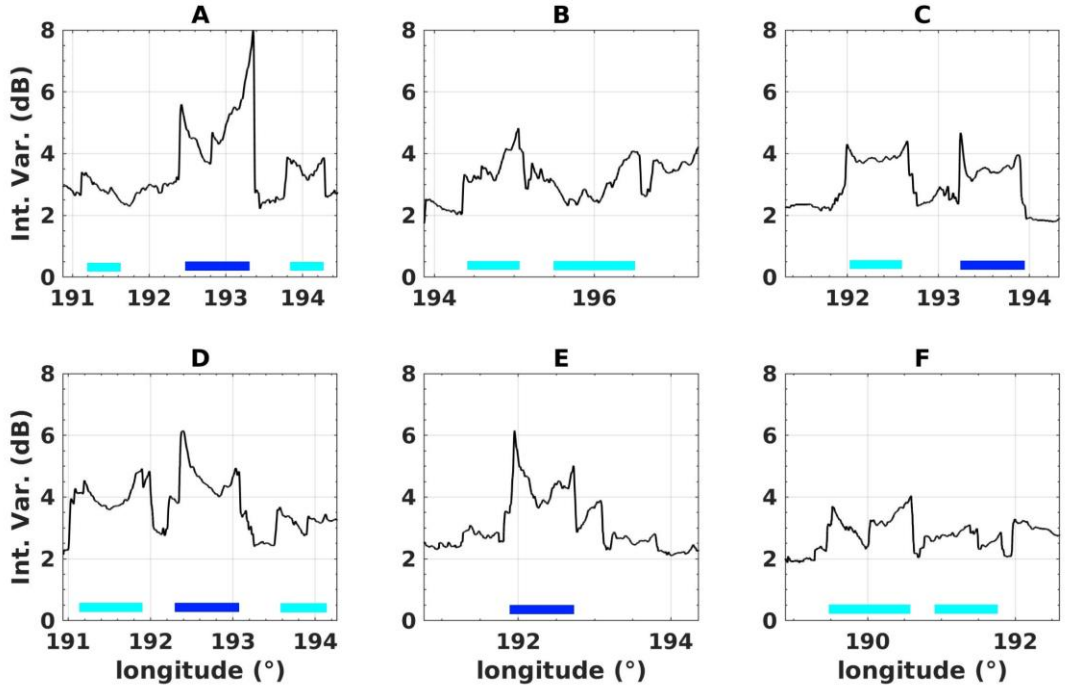
Intensity variability computed using equations 6 and 7, assuming $\varepsilon_{dry} = 7$ and considering three different wet-dry mixing ratios (magenta, red and black lines). The cyan dashed line represents the permittivity threshold $\varepsilon_b = 15$ which, on Earth, is usually associated with wet materials[26] and the dashed blue line is the intensity variability threshold for dry to wet basal transition[34].

Supplementary Figure 4



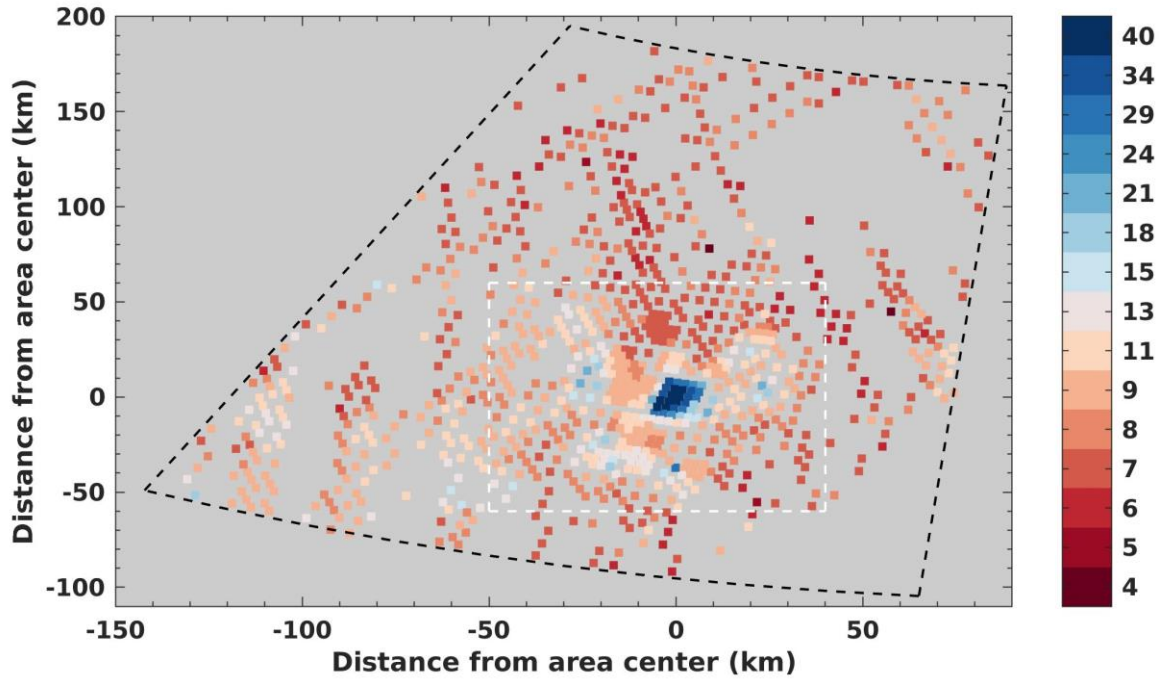
Enlargement of the normalized basal intensity map shown in Fig.4a. White lines highlight six observations crossing the main body of water and the lateral patches.

Supplementary Figure 5



Intensity variability values computed using equation 3 for the six observations illustrated in Supplementary Fig. 4. The blue dashed lines mark the intensity variability threshold for the dry-wet transition according to Jordan et al.[34]. Dark blue lines indicate the position of the main body of liquid water, cyan lines the lateral water patches.

Supplementary Figure 6



Scatter map of the basal permittivity. The white dashed box indicates the area analyzed in Fig. 5. The size of the dots in the map is not representative of the pixel dimension.