



Experimental approach in understanding the dielectric properties of the Martian polar-layered deposits

E. Heggy and S. Clifford

Lunar and Planetary Institute, 3600 Bay Area Boulevard, Houston, Texas, 77058-1113, USA
(heggy@lpi.usra.edu)

The dielectric properties of the dust-ice mixtures (also referred as dirty ice) is a key parameter in understanding the suitability of the layered deposits in the Martian poles for radar deep subsurface sounding and hence investigating the poles stratigraphy and the potential presence of sub-glacier melting at the base of the structure. In a first step to experimentally investigate the frequency, compositional and temperature dependence of this parameter we measured the dielectric properties of several model of mafic dust and use mixture formulas to investigate the effect contamination in ice for different concentration and temperature in the frequency range 1 MHz-1 GHz. Results are compared to ongoing laboratory measurements of ice-dust mixtures in the temperature range -10 to -80 °C. In the light of this analysis we suggest some outlines on the geoelectrical constrains in terms of losses and dielectric contrast for mapping the layering and the sub glacier melt in the polar deposits.

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