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# Experimental and Parametric Investigation of the Dielectric Properties of Martian Surface Sediments and Polar Ice-rich Analog Materials

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The dielectric properties of the Martian dust and ice-dust mixtures (also referred as dirty ice) are key parameters in the interpretation of the MARSIS and SHARAD radar data of the layered deposits in the Martian poles as well as the for radar deep subsurface sounding in near-equatorial region. We have experimentally investigated the frequency, compositional, density and temperature dependency of the real and imaginary part of the dielectric constant for several models of mafic dusts and their ice-mixtures to investigate the effect of ice contamination with different dust concentrations, densities and temperature in the frequency range 1 MHz-1 GHz. Using the TES spectroscopy and thermal inertia data, the laboratory results are then integrated in two distinct dielectric models forming two parametric dielectric maps of the Martian surface. The first map covers the near-equatorial regions with latitudes ranging from -60˚ to +60˚ and the second map covers the North and South Polar Regions. Both maps show an important geographical variation of the surface dielectric properties of the Martian surface with real values at 2 MHz ranging from 2.6 to 13 for the equatorial regions and 2.8 to 5.1 for the polar terrains.