



Polar layered deposits of Mars as seen by MRO/SHARAD

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As on the Earth, Martian ice caps provide a record of the recent geologic and climatic history of the planet. Since the beginning of Mars exploration, unmanned probes have provided large quantities of data that allowed comparison of the overall topography and geologic histories of the two polar regions to be made, highlighting specific outstanding questions in Mars polar studies.

From November 2006 the SHARAD subsurface sounding radar on board NASA's Mars Reconnaissance Orbiter began sending data with a higher vertical resolution than the data from MARSIS, the radar that for the first time ever sent signal from within the martian crust on ESA's Mars Express. The high vertical resolution of SHARAD allows the detection of geological structures that were not visible to MARSIS.

The most impressive of all the data acquired up to now came from the polar regions,

where SHARAD demonstrated its capability of penetrating to depths of far more than a kilometer. Signals acquired over both northern and southern Polar Layered Deposits (PLD) show strong reflections from the surface and several continuous less intense reflections from within the polar deposits. From all the available data it is possible to interpret signal returns as the effect of 1) the contact between the layered deposits and underlying materials and 2) the internal layering of the polar layered deposits.

Here we present the analysis of subsurface features detected by SHARAD within the northern and southern pole of Mars with an emphasis on the differences found on signals returns between the two antipodal regions.