Latest Results from Mars Advanced Radar For Subsurface and Ionospheric Sounding

Safaeinili*[1], J. Plaut[1], W. Kofman[2], J. Mouginot[2], G. Picardi[3], [1]Jet Propulsion Laboratory, Pasadena, 91109, USA. [2] Labratoire de Planetologie de Grenoble, CNRS/UJF, France, [3]Dipartimento INFOCOM, University of Rome ``La Sapienza", Rome 00184, Italy.

We present the latest results from Mars Advanced Radar for Subsurface and Ionospheric Sounding (MARSIS) radar that is currently operating on the European Space Agency's Mars Express spacecraft. MARSIS echoes can be obtained at any of the four MARSIS subsurface sounding bands with center frequencies of 1.8, 3.0,4.0 and 5.0 MHz with a one MHz bandwidth. MARSIS has successfully mapped the south polar layered deposit of Mars and has obtained significant coverage of the Northern layered deposits. It has also discovered radio transparent deposits in the equatorial regions over areas known as "stealth" regions of Mars. Our radar data along with SHARAD data has provided new insight into the nature of the material forming these geological features.

In addition to probing the Mars subsurface, MARSIS is a very capable topside ionospheric sounder operating over the 0.1-5.5 MHz frequency band. MARSIS has provided a wealth of new information about Mars' ionosphere. Even over subsurface sounding mode frequencies (1.3-5.5 MHz), the roundtrip propagation of radar pulse through the ionosphere causes frequency dependent slowing of the wave. This information needs to be corrected during subsurface data processing step. The correction values have provided us with another means of studying the Mars ionosphere.

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