



First Radar Observation of Phobos by MARSIS

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On November 4th 2005, Mars Advanced Radar for Subsurface and Ionospheric Sounding (MARSIS) on board Mars Express flew by Phobos at the closest approach distance of 239 km. During this flyby, MARSIS successfully executed a radar observation of Phobos using all of its four 1-MHz bands centered at 1.8, 3.0, 4.0 and 5.0 MHz. During the 7-minute flyby, MARSIS collected data in a special mode where time-domain echoes were stored in the internal instrument memory without any real-time processing. We collected a total of ~16000 echoes. After chirp compression and synthetic aperture processing on the ground, we have obtained echoes from Phobos with signal-to-noise level of ~ 25 dB. We will describe our observation approach and present first radar echoes observed from Phobos by MARSIS. We will also present the result of radar modeling using the available Phobos digital elevation maps trying to answer the question whether the observed late returns are from surface features or subsurface structures on Phobos.

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