



Admittance analysis of Mars Express line-of-sight data

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One of the tasks of the Mars Express Orbiter Radio Science Experiment (MaRS) consists in measuring radio signal Doppler shifts near pericenters above selected target areas. Due to the low altitude of the spacecraft at pericenter (250 km-1000 km), the corresponding residual line-of-sight Doppler data contain a significant contribution from underlying short-wavelength gravity anomalies, which should be explained by the structure of the crust and lithosphere. We thus assume that the line-of-sight accelerations result from the topography and its compensation by lithospheric flexure. We can then constrain the lithospheric thickness and the crustal density by an admittance analysis of the observed and simulated line-of-sight accelerations.