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Martian atmospheric entry profiles and atmospheric tides

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In this study we revisit trajectory and atmospheric reconstructions during Mars Entry Decent and Landing (EDL) with a specific focus on the Phoenix mission. Oscillations in temperature profiles derived from atmospheric entry probes are caused by a wide variety of waves and tides. We analyze vertical wavelengths and amplitudes of these oscillations in order to identify the effects of atmospheric tides on atmospheric entry profiles. The atmospheric profiles and the tidal analysis are compared with previous Mars entry reconstruction studies as well as with orbital remote sensing data such as those by the Mars Climate Sounder (MCS) instrument on the Mars Reconnaissance Orbiter (MRO).