

SEG - Seismology and Geodynamics

Master Thesis



Seismology on Mars

The main aim of this Master thesis project is to examine the seismic response of a series of synthetic models of Mars using various seismic methods and to examine their capability of illuminating interior structure.

The upcoming Mars Insight mission will land a single three-component long- and short-period seismometer on Mars with the purpose of investigating internal structure. It will be important to establish, prior to deployment, which seismic methods are best suited, within the constraints of instrument capabilities, to address questions related to Martian origin and evolution. This includes, physical state of

the Martian core and existence of an asthenosphere that potentially involves partial melting, among others.

To gain better understanding, we would like to examine the seismic response of of synthetic Martian models using

1. synthetic seismograms,
2. travel-time distribution,
3. surface-wave dispersion,
4. wave-conversion characteristics (receiver functions), and
5. normal-modes

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