

Designing a martian broadband seismometer system under surface wind environment.

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The surface of Mars has been extensively investigated and huge amount of data have been acquired such as high resolution images. On the other hand interior of the Mars has been only weakly constrained by the mean density, the moment of inertia and gravity data. A major purpose of seismic observation on the planet is to detect the distribution of seismic velocities. Using the seismic velocity data, we provide the primary evidence for the process of differentiation whereby material within planets became compositionally segregated during their evolution. But the current available Mars interior models based on indirect and insufficient data, since we have no seismic information about Mars. Melos project is Japan Mars exploration project. It is now under consideration. It will launch about 2020s. This project includes seismic observation plan. The plan is to install broadband and high sensitivity seismometer. The purposes of this presentation are to reveal relationship of frequencies of the Mars planetary free oscillation to it's core states, by considering several set of 1 dimension models of elastic velocity and density. In addition to the calculation, we designed a martian seismometer wind shelter with a small torque (a large torque makes large noisy data) by using wind tunnel tests and computation fluid dynamics simulations.

Keywords: Mars, broadband seismometer, internal structure, wind shelter, planetary free oscillations, CFD