Geophysical Research Abstracts
Vol. 19, EGU2017-5626-2, 2017
EGU General Assembly 2017

The seismic signatures of the solar system

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Seismology is a powerful tool to image the interior of planetary bodies. At the same time, its results are often difficult to visualize. The spectral-element solver AxiSEM (Nissen-Meyer et al. 2014) enables calculations of the broadband seismic response of terrestrial bodies with solid crusts and mantles, as well as icy moons with solid ice crusts overlying liquid oceans.
In its database mode, Instaseis (van Driel et al. 2015), AxiSEM can efficiently calculate the seismic response for earthquakes at arbitrary distances and depths. We use this method to present a set of global stacks of seismograms, similar to the iconic global stack that Astiz and Shearer (1996) created for IRIS from thousands of seismograms on Earth.
We present these stacks for models of Europa, Enceladus, Ganymede, Mercury, Venus, Moon and - for comparison - Earth. The results are based on thermodynamical modeling for the icy moons and orbital observations for the terrestrial planets. The results visualize how each planet and moon has its own unique seismic wavefield and which observables exist to infer its detailed structure by future lander missions.

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