

Title: Passive seismic reflection imaging on the earth and on the moon

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Abstract:

A recent development in geophysics is the retrieval of the earth's seismic reflection response from passive measurements of natural noise signals. In the standard seismic reflection method, man-made sources at the earth's surface generate seismic waves which, after reflection in the subsurface, are recorded at the surface and transformed into an image of the subsurface. The use of man-made sources can be avoided by passively monitoring the response of natural noise sources in the earth's subsurface with geophones at the surface. By combining the noise recordings of different geophones in a specific way it is possible to simulate a seismic reflection response as if there were a source at one of the geophone positions. This opens the possibility of imaging structures and monitoring processes in the subsurface without using man-made sources. On earth this relatively new method is going to be applied to the geophysical data that will be collected with the Lofar network. It is the intention to set up a network similar to Lofar on the moon. The geophysical sensors in this network will record lunar seismicity due to impacts, crustal stresses and tidal forces. By employing the passive seismic imaging technique we hope to be able to get insight in the structures and composition of the interior of the moon.