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Mars continuous signal polarization analysis

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The InSight mission landed on Mars on November 26th, 2018 with several geophysical instruments including a short-period seismometer and a broadband seismometer (SEIS, Seismic Experiment for Interior Structure). Both seismometers are now installed directly on Mars surface and enable to analyze the continuous seismic signal.
The purpose of this study is to analyze, quantify and characterize the frequency-dependent polarization of Mars continuous seismic signal. On Earth, the secondary microseisms are the dominant signals in the absence of earthquakes. Secondary microseisms are dominantly Rayleigh waves, with elliptical polarization in the vertical plane. We do not expect to record microseisms on Mars because of the absence of oceans.
We adapted the method developed for Earth data by Schimmel et al. (2011) to analyze the frequency-dependent polarization of continuous Mars data. The method enables to detect elliptically polarized signal such as Rayleigh waves and also linearly polarized signals that could be either Love waves or body waves.
The method was tested on the two blindtest datasets provided by the Marsquake Service (MQS) and by the Mars Structure Service (MSS). It is then applied to analyze the first data recorded on Mars by the broadband and the short period seismometers.