



One-station wavefield back propagation for Mars quake detection

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The time-reversal (or migration) operator can infer to the source location and mechanism. It is essentially a cross-correlation of observed seismograms and the Green's function from the station to an arbitrary point. When we have a good coverage of seismic stations and a robust knowledge on the structure, this method is well known to work. Here we have a set of synthetic waveforms for a Mars structure calculated with Direct Solution Method up to 0.1 Hz, and a real dataset of Californian regional seismograms recorded only at one station (Hector Mine event at PHL station, $M_w = 7.1$). We tested with the two datasets (synthetic with several stations, observed with one single station) in order to detect/locate quakes with a single seismic station, and will also test with blindtest datasets provided by Marsquake Service and Mars Structure Service.