

Supporting Information for "First in-situ seismic record of spreading events at the ultraslow spreading Southwest Indian Ridge"

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Additional Supporting Information (Files uploaded separately)

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Introduction The supporting information include three figures supporting our results and interpretation. Fig. S1 shows example spectrograms for one day in January and one day in April. Additional 1 minute spectra of each example day are shown for comparison. Waveforms of phases without and with tremor activity together with corresponding particle motion is shown in Fig. S2. In Fig. S3 the results of a frequency analysis of tide and tremor signals in April are shown. Additionally, an excel file containing the earthquake catalog is uploaded seperately.

References

Egbert, G. D., & Erofeeva, S. Y. (2002). Efficient Inverse Modeling of Barotropic Ocean Tides. *Journal of Atmospheric and Oceanic Technology*, 19(2). doi: 10.1175/1520-0426(2002)019\<0183:EIMOBO\>2.0.CO;2

Table S1. Earthquake catalog showing events that were relocated with HypoDD. It gives location, time and magnitude of the events. The file is uploaded as "2018GL079928_tab01.xlsx".

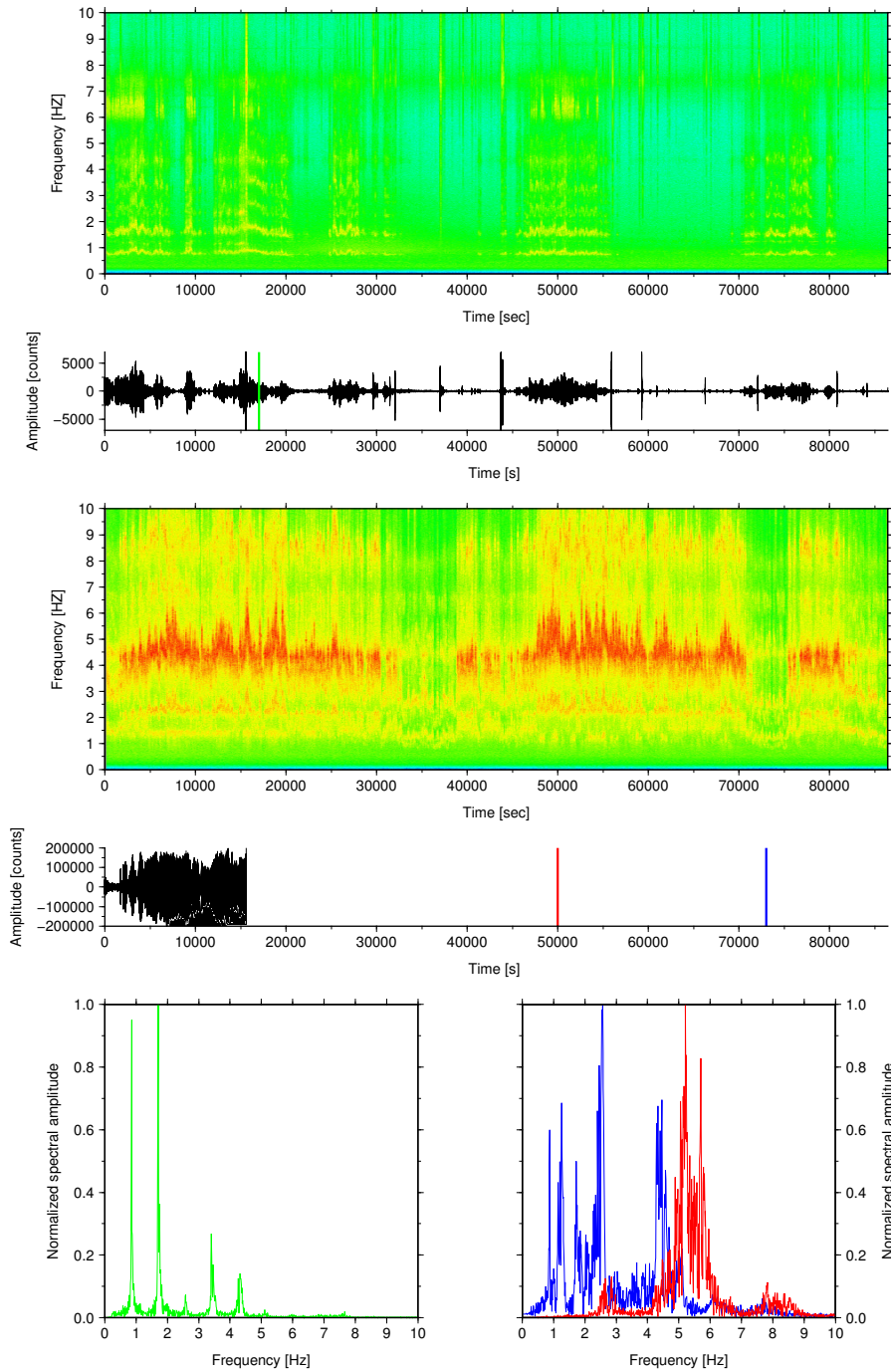


Figure S1. Top: Spectrogram and waveform filtered 0.7-25 Hz for 25.12.2012. Spectrograms are calculated from 360s windows with 95% overlap. Middle: Same for 30.4.2013. Bottom: Individual spectra calculated from 1 min windows at the locations marked by the matching coloured bars in the waveforms. Spectral amplitude is normalized to compare shape of the spectra.

September 5, 2018, 11:32am

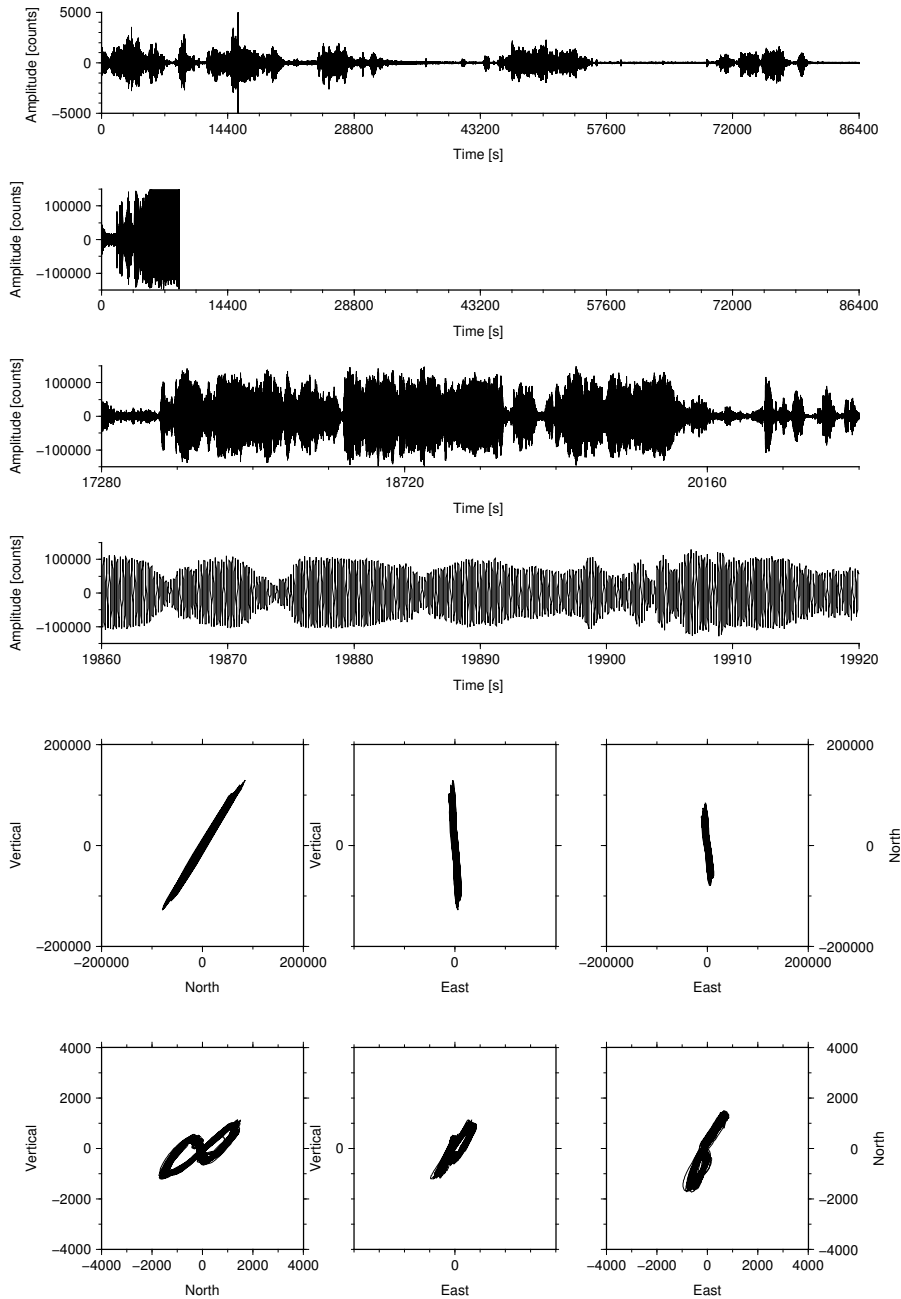


Figure S2. Top: Waveform of 1 day of tremor before onset of January swarm on 25.12.2012, filtered to fundamental frequency between 0.7 and 4 Hz. Middle: Waveform of 1 day, 1 hour and 1 minute of tremor during the most intense tremor phase on 30.4.2013, filtered 0.7-6.5 Hz to include strongest frequency band (see. Fig. S1). Bottom 1st row: Particle motion corresponding to 1 minute waveform above. 2nd row: Particle motion of tremor in December (top waveform) between 1320s and 1380s.

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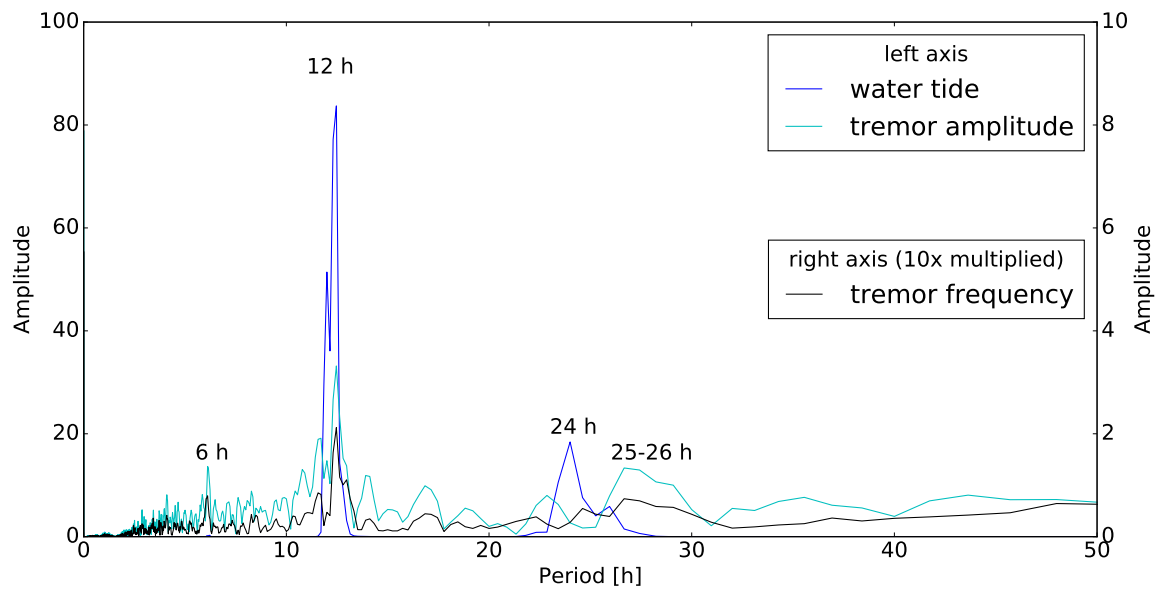


Figure S3. Comparison of the frequency of tremor signal in April and tides. The tidal signals from OTPS egbert02 calculated for station RUM48 in 30 minute steps and the maximum frequencies and corresponding spectral amplitudes of the tremor signal within the frequency band 0.49 to 2.0 Hz were used. Blue: water tide, cyan: amplitude of the tremor signal, black: frequency of the tremor signal. The right ordinate shows ten percent of the left ordinate, because of very different amplitudes.