Seismic activity level of Mars estimated from 380 Sols of InSight data

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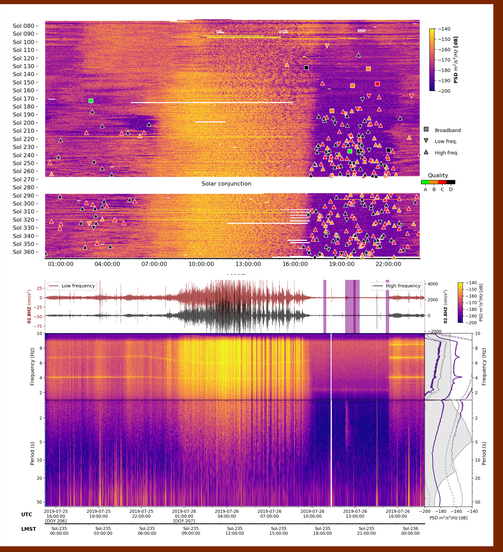
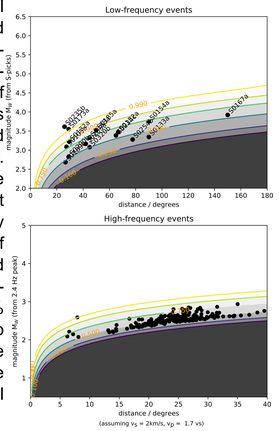
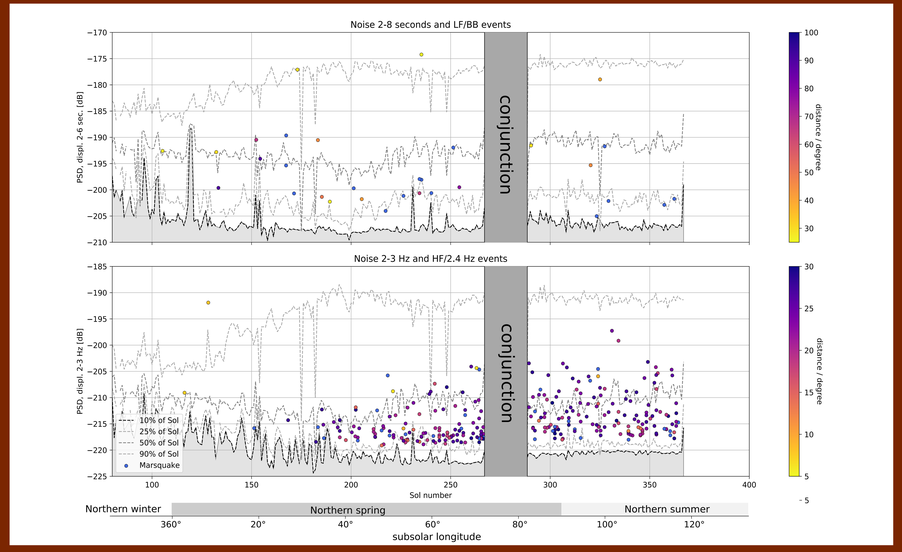
Seismic noise over mission



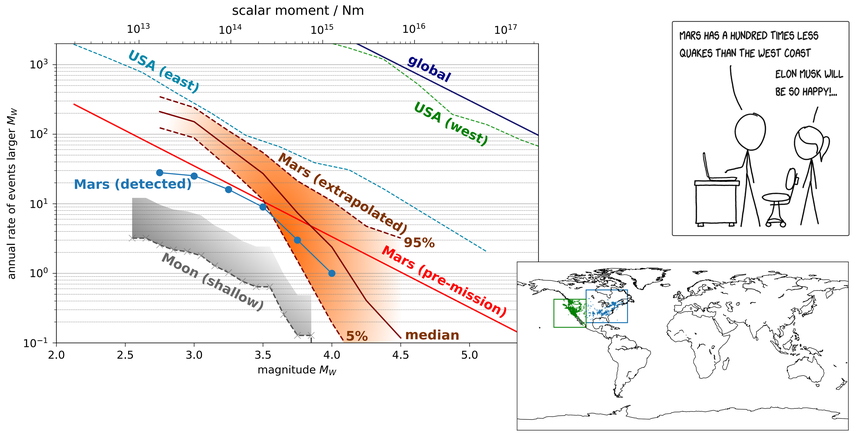
Due to the high diurnal variation of noise and the fact that the network has only one station, the magnitude of completeness varies over the day and depends on distance. The global magnitude of completeness is yet unknown, but probably above Mw=5. Most of the events we detected would have been detectable during 20-30% of the mission only, so the detected events are not a representative sample of the global activity.



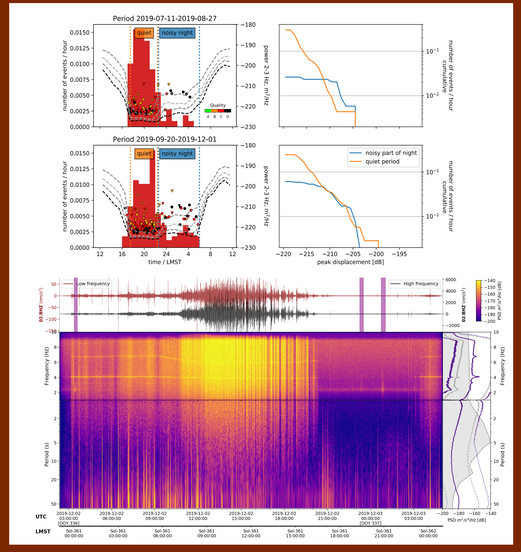
Noise vs event amplitudes



Estimated annual global seismic activity



Event distribution over day



Conclusions

The annual seismic activity of Mars has been extrapolated from the observed number of events and the detection probability based on the noise evolution over the mission. It is found to be significantly above lunar seismicity and - for magnitudes smaller 3.5 almost as large as western Northern America, a heavily deformed intraplate area. Events above 3.5 are noticably missing from the current set.

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