

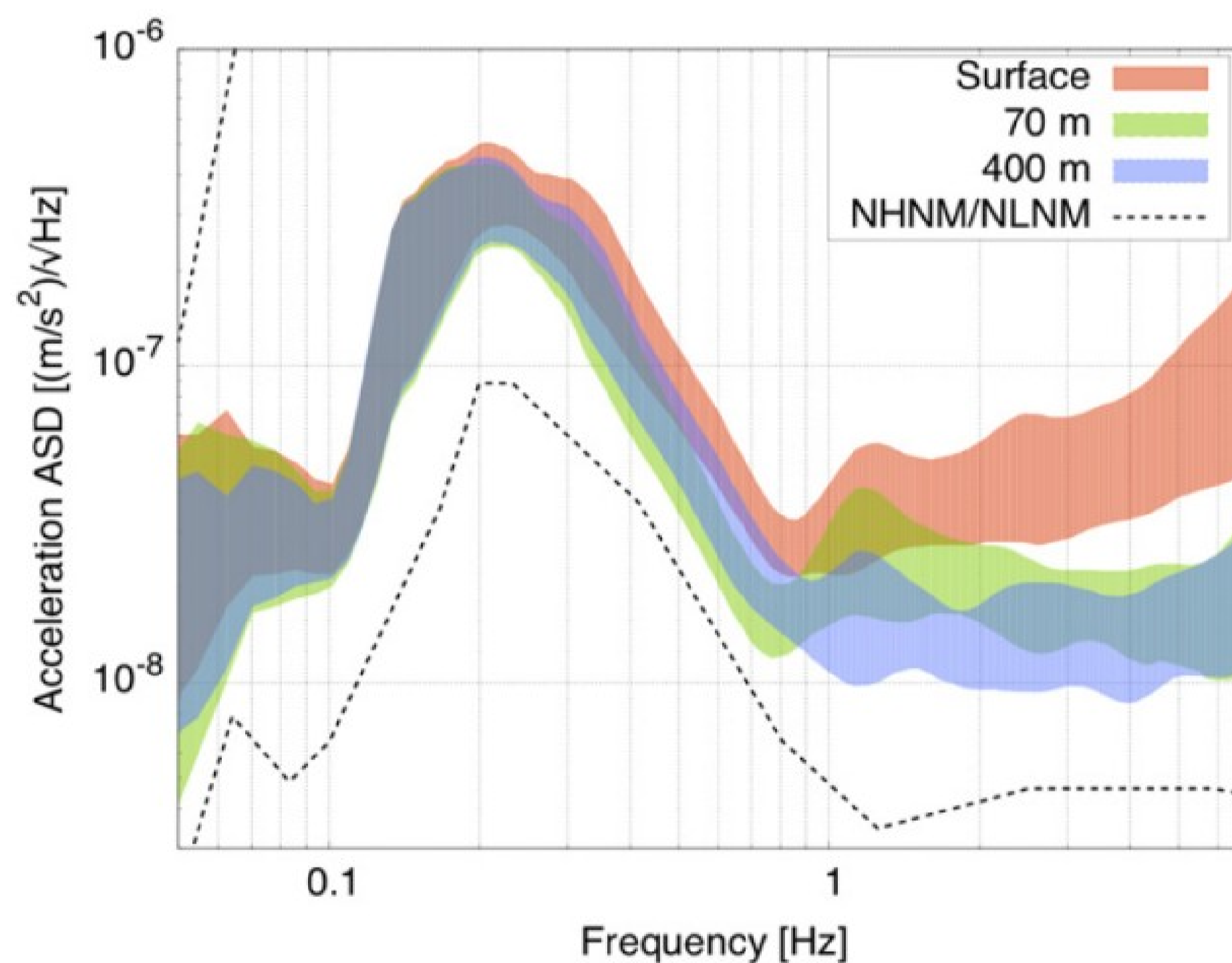
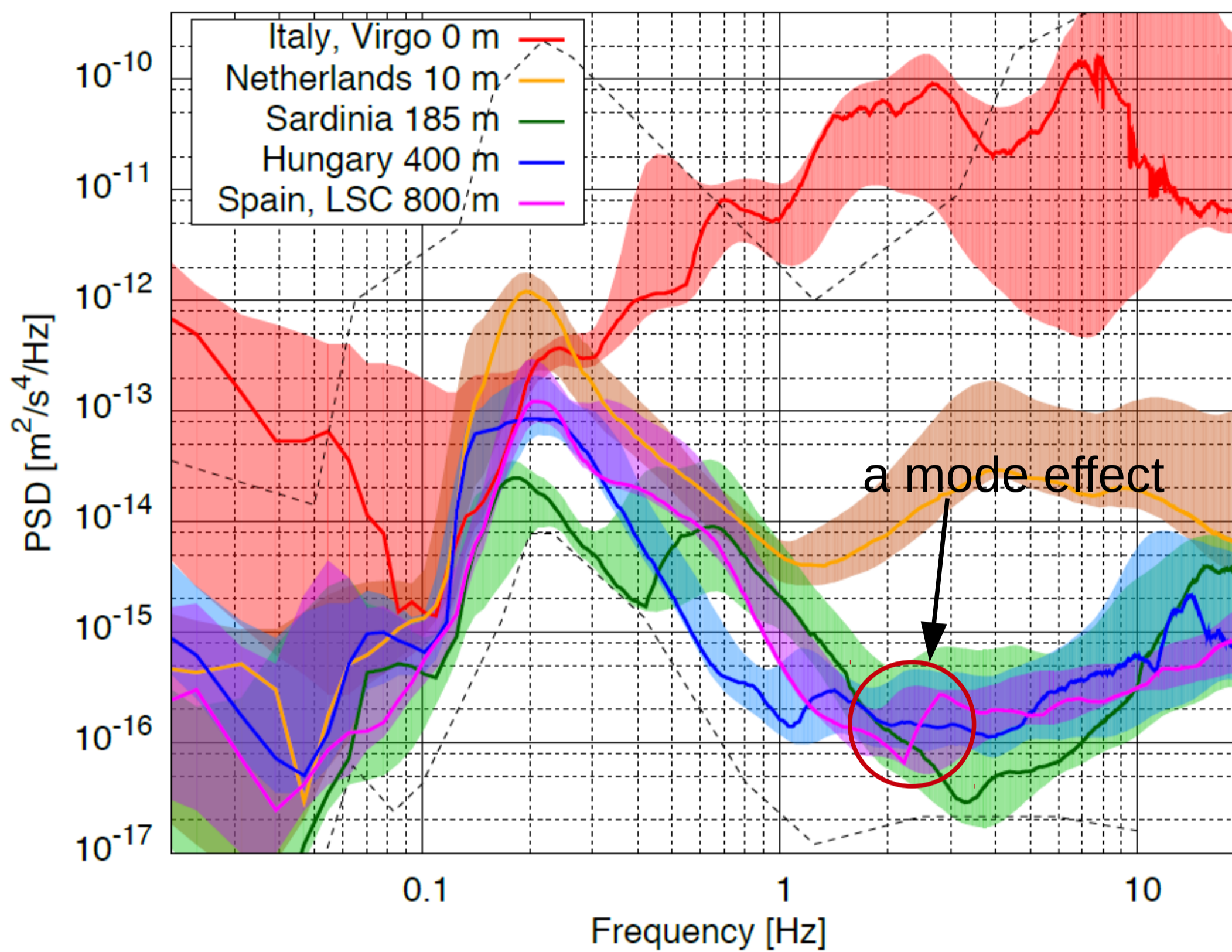
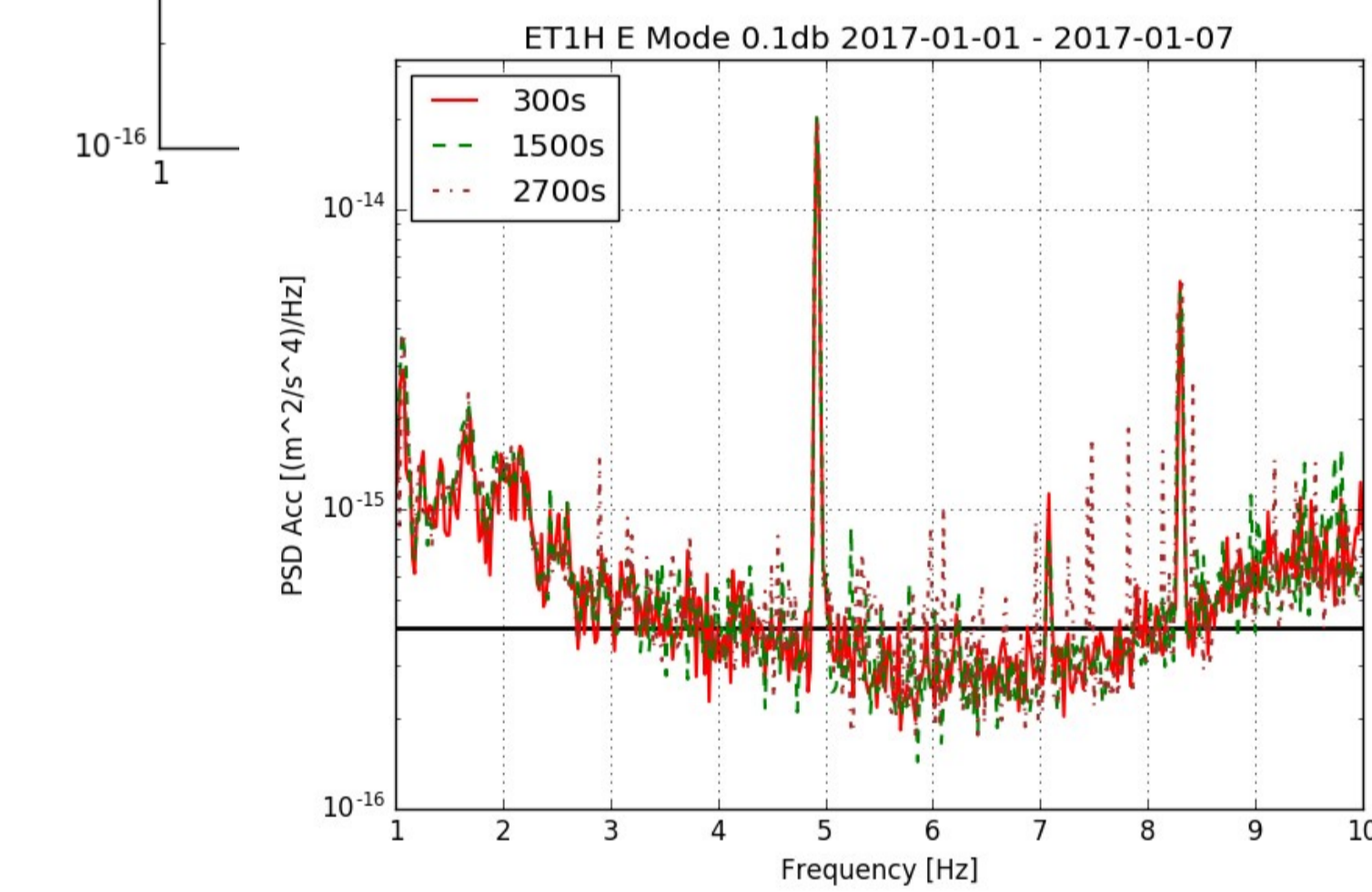
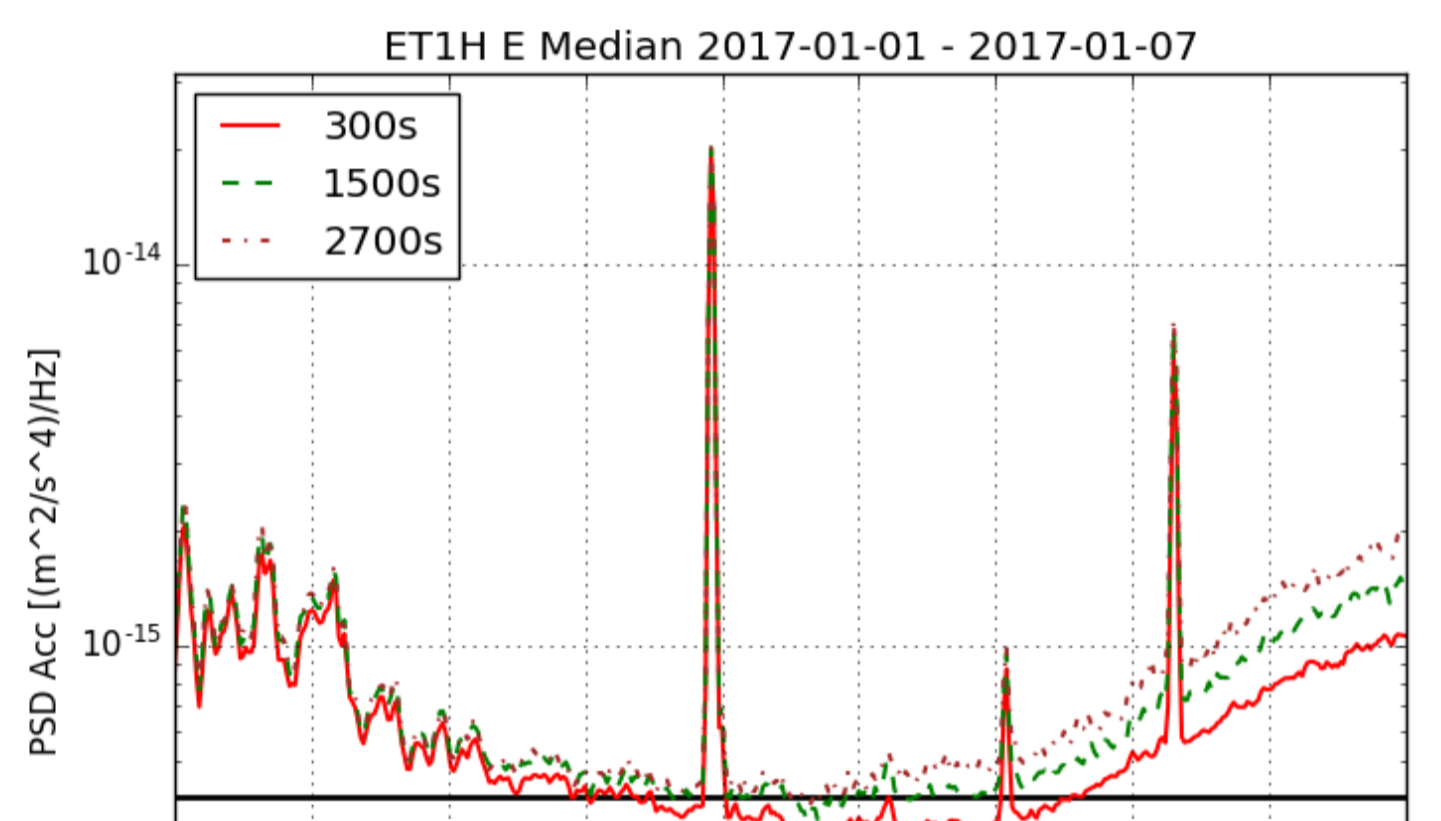
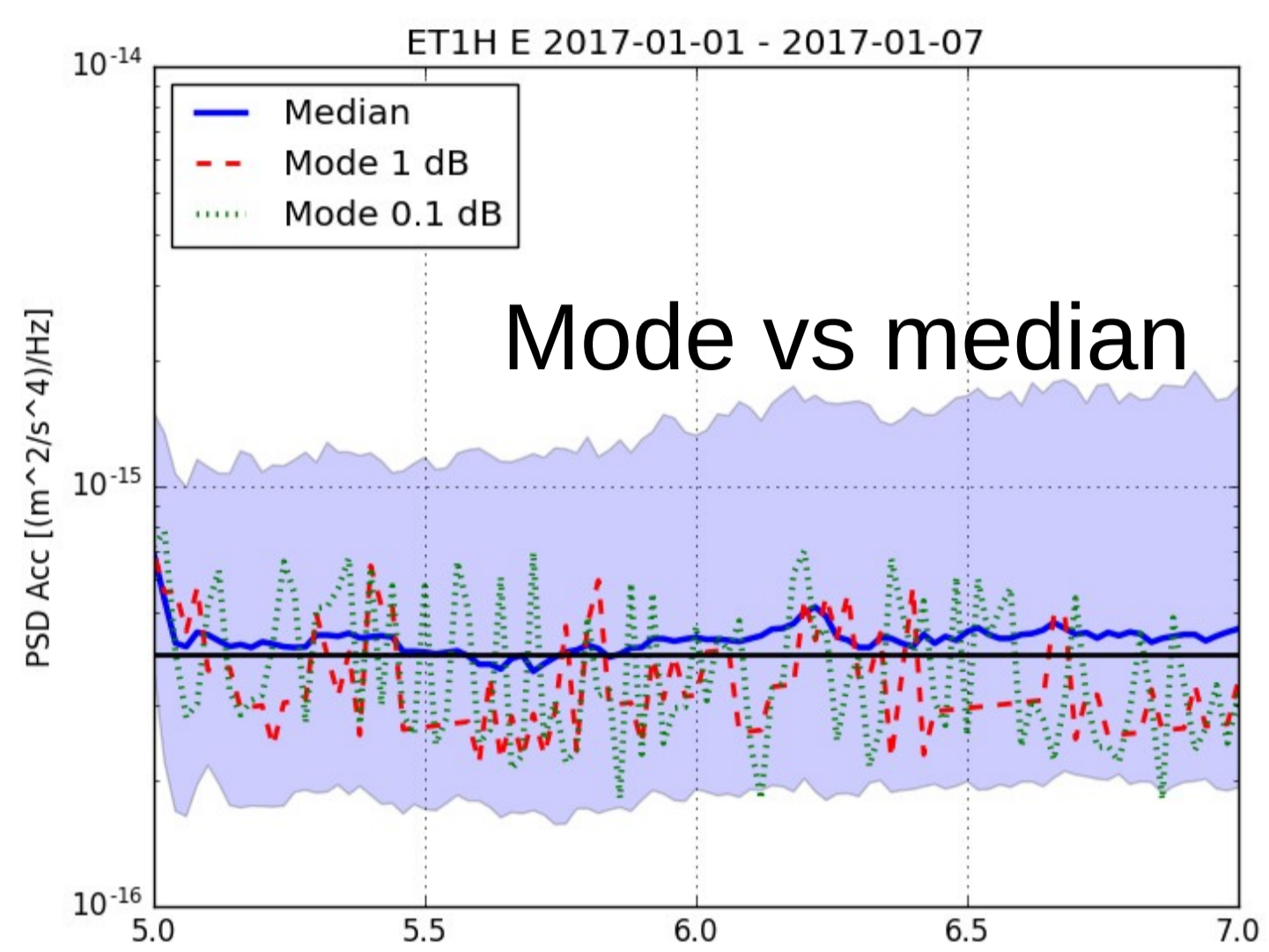
# Seismic noise measures for underground gw detection.

## Experience from the Mátra site.

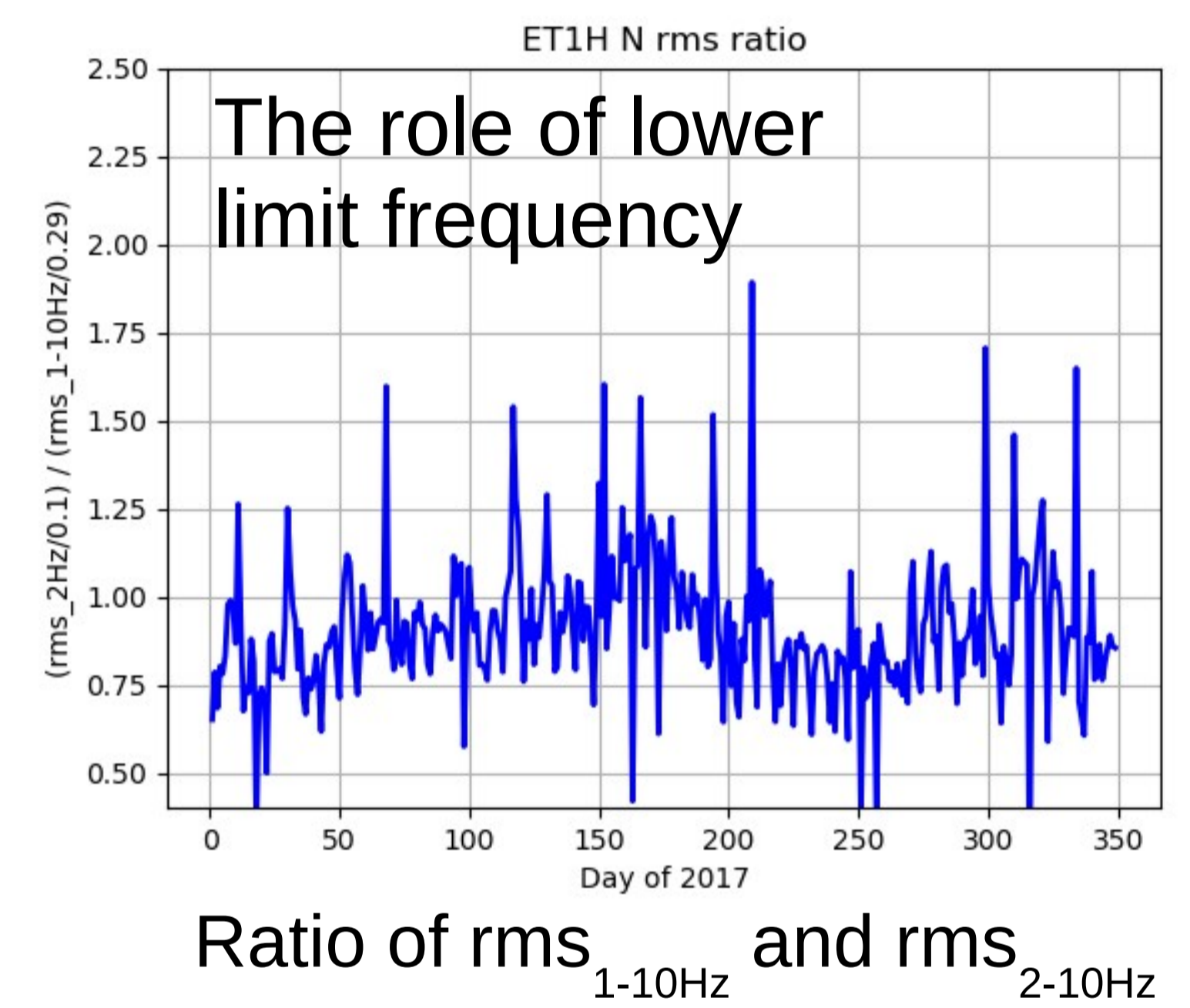
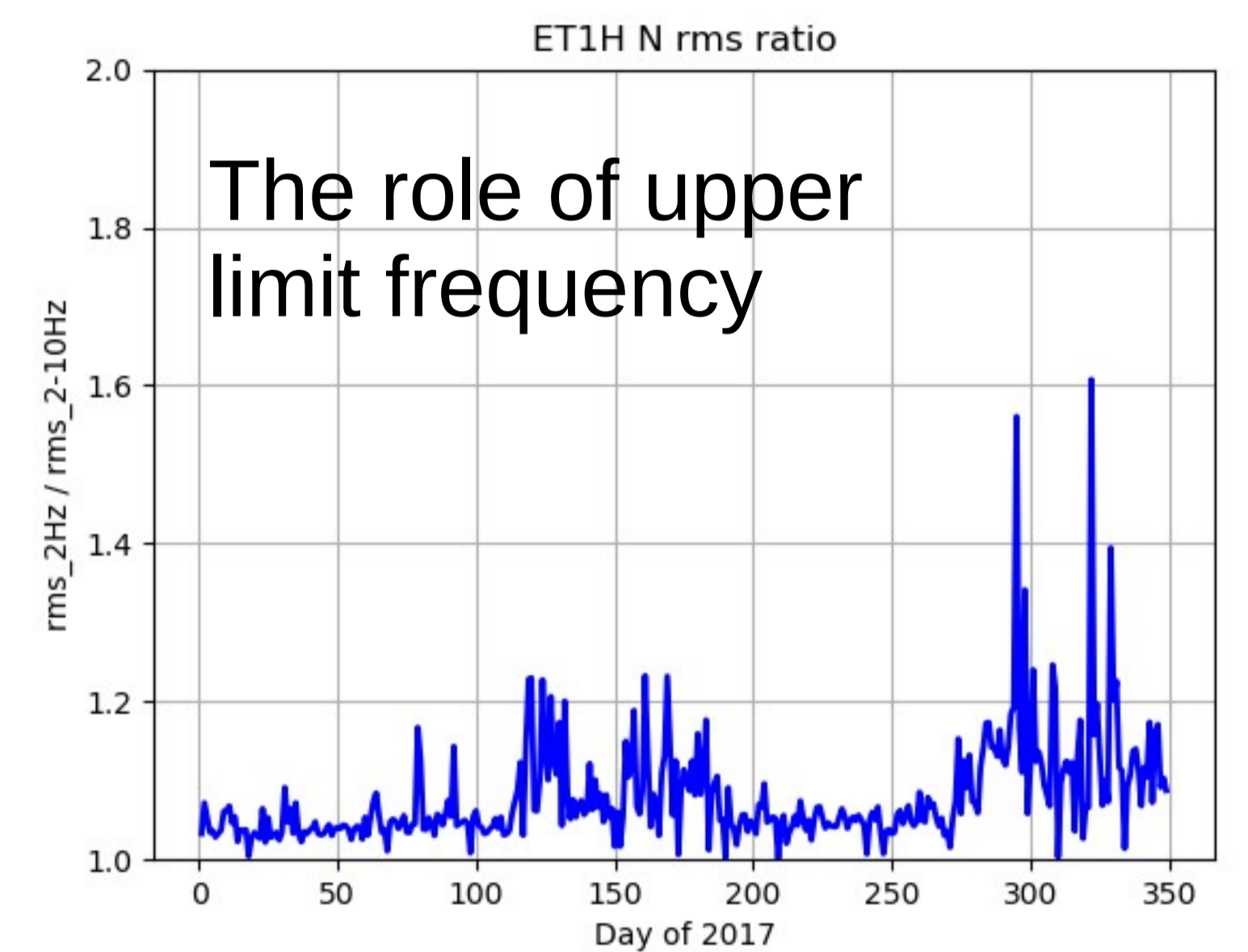


- Percentiles provide natural extreme noise filtering.
- Median is more stable than modulus.
- Noise from above 10Hz distorts rms.
- Noise below 2Hz is influential.

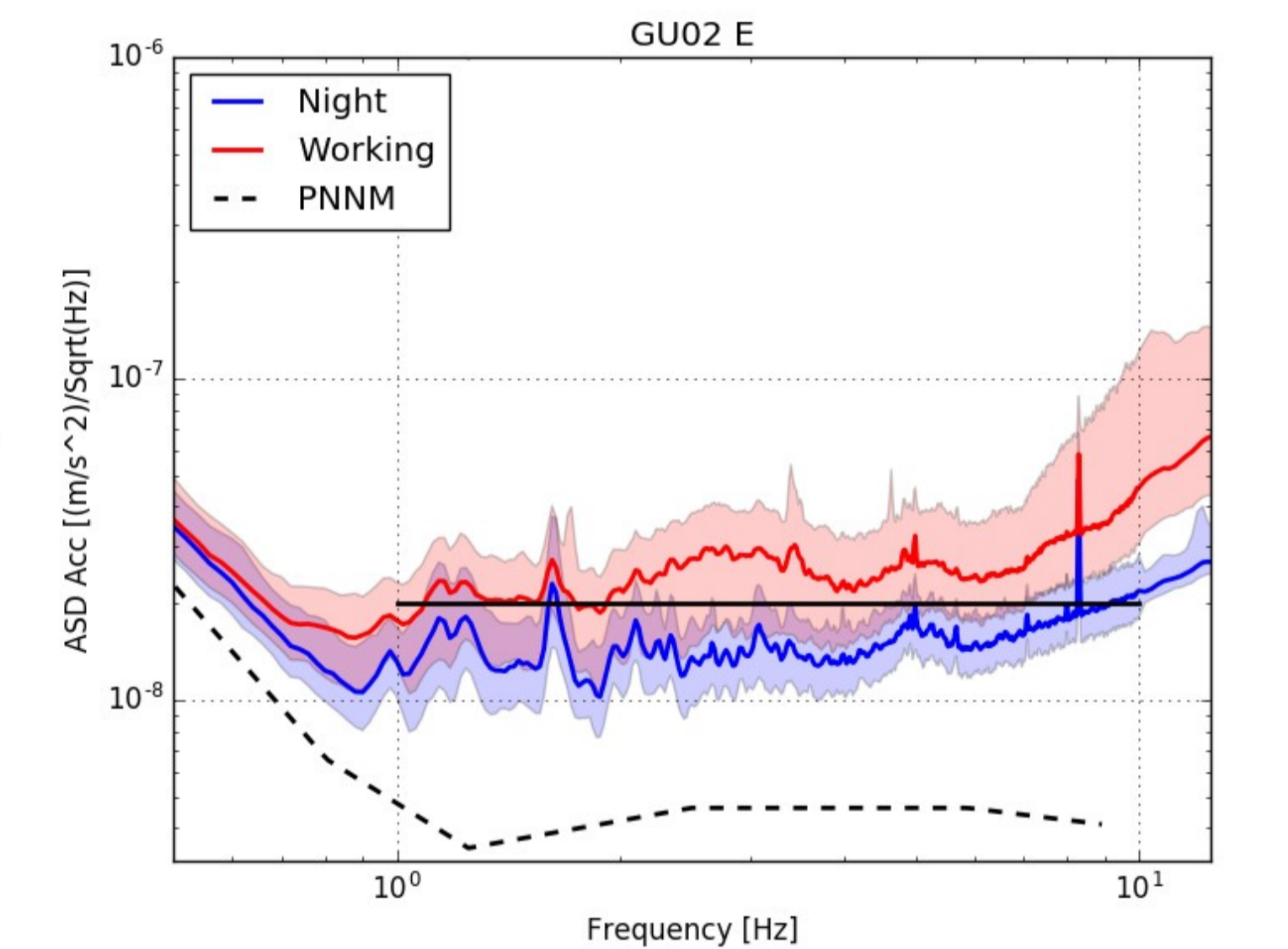
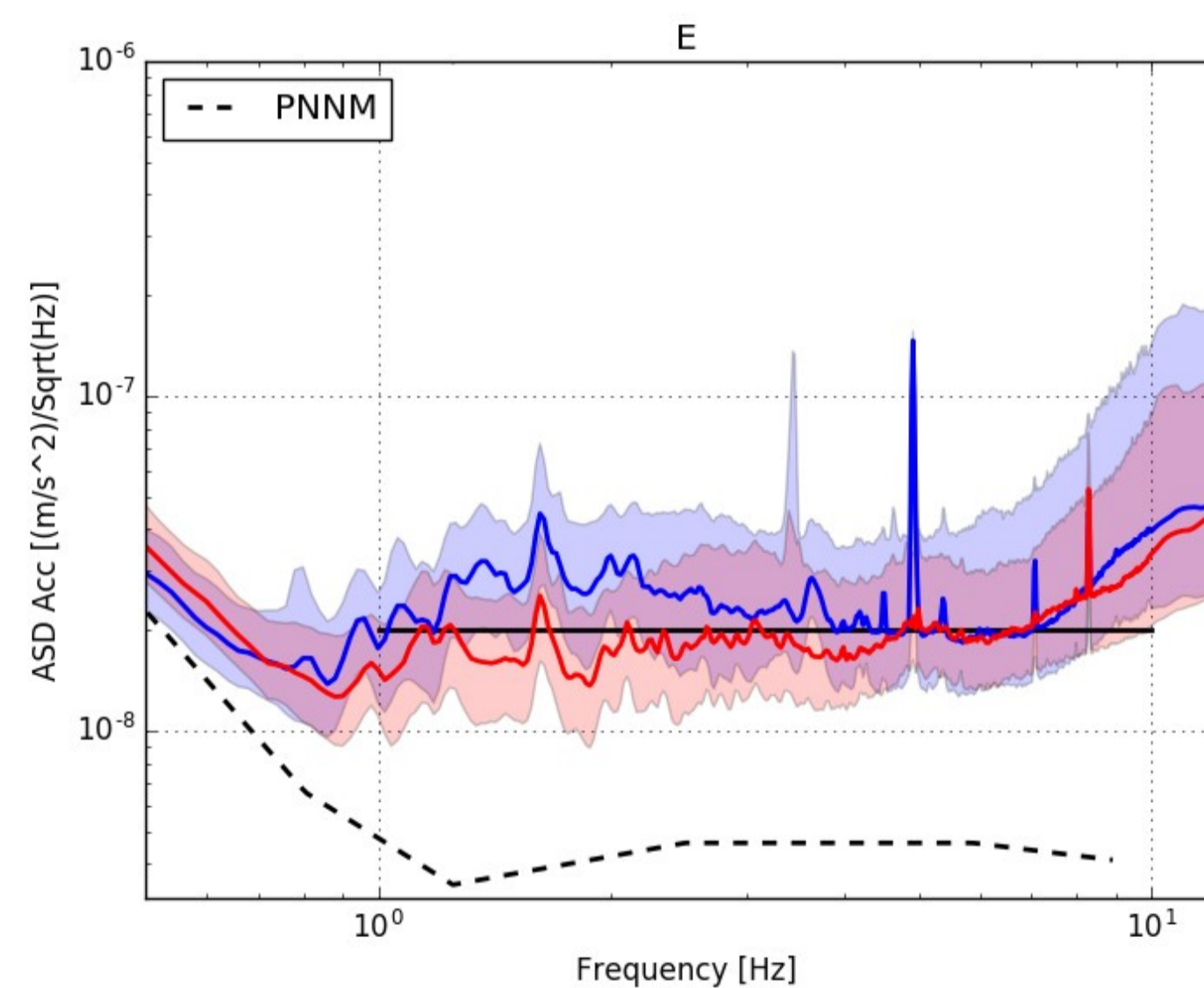
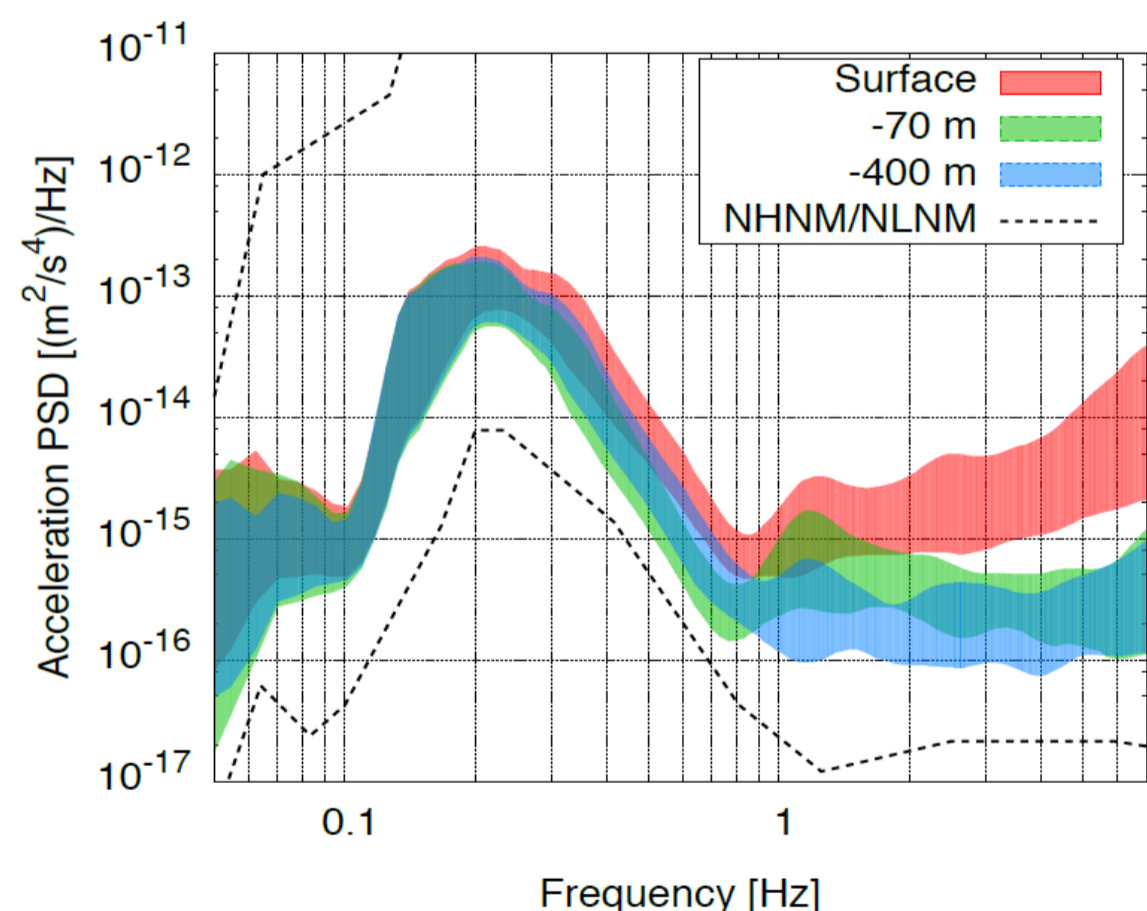
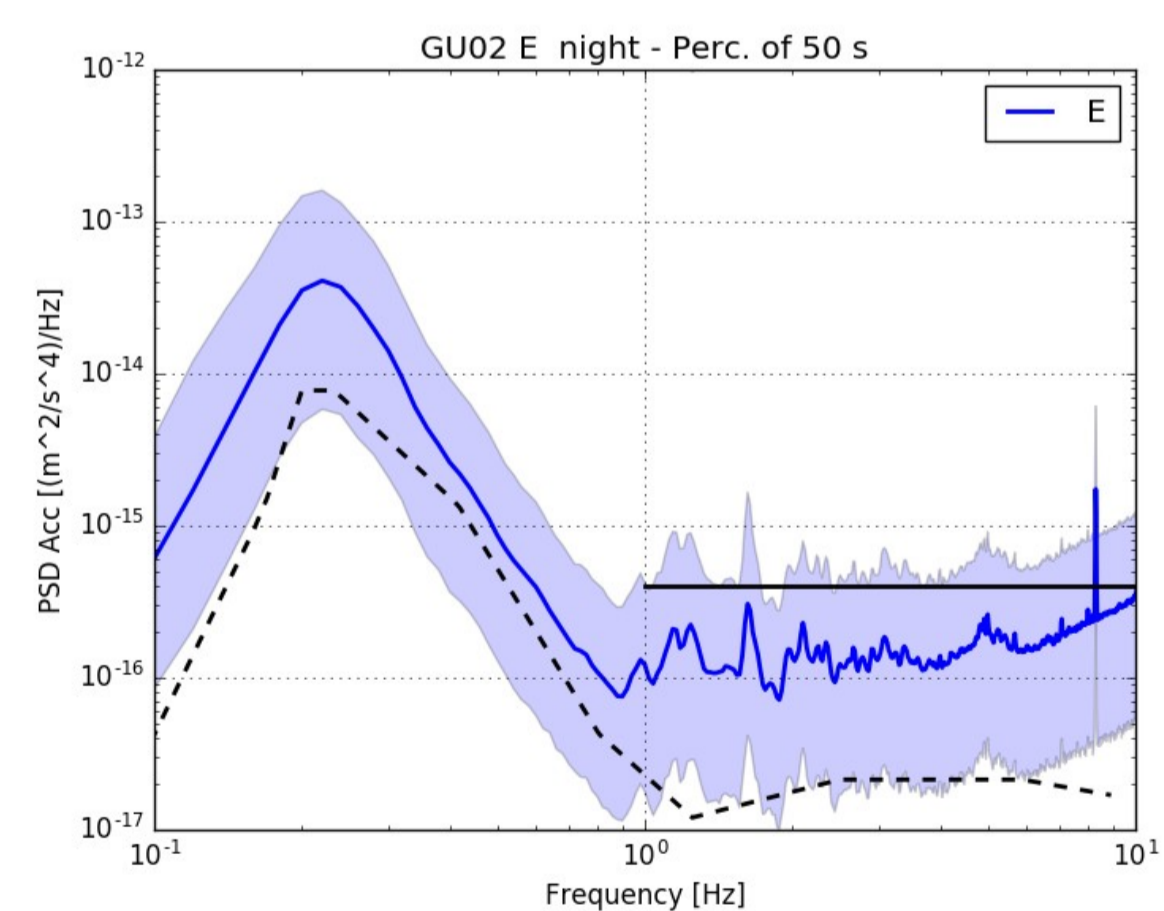
### Spectral properties



### Cumulative characterisation: displacement rms [nm]



### Effect of depth in Mátra [1,3]



Optimal noise: -404m at night

Comparison of -88m and -404m for 2 weeks

Difference of night and work periods at -404m

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M. VASÚTH,  
Z. WÉBER  
P. VÁN



### References:

- [1] Beker, M.G. Low-frequency sensitivity of next generation gravitational wave detectors, Phd thesis (2013)
- [2] Beker, et al. Subterranean ground motion studies for the Einstein Telescope, Class. Quantum Grav. (2015) 025002.
- [3] Somlai et al., arXiv:1810.06252
- [4] Ván et al., arXiv:1811.05198

Low frequency sensitivity and multimessenger potential for BH mergers with equal masses:  
 $t(1\text{Hz}) = 89.6\text{h}$ ,  $t(1.5\text{Hz}) = 30.4\text{h}$ ,  $t(2\text{Hz}) = 14.1\text{h}$  ( $M_c = 1.52$ , gw170817 signal)