Seismic Noise Characterization in Belgium: noise level maps and hurricane tracking capability

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In this study, we present the spatial and temporal variations of seismic noise levels for different frequencies (anthropogenic, primary and secondary microseism) in Belgium.

We quantify the noise field far away from its sources and observe the geographical variation of microseisms through Belgium.

Following the methodology of M. Möllhoff et al., 2016, we calculate seismic power spectral densities and power density functions from 2016 and 2017 microseism data measured in Belgium in order to obtain frequency dependent statistics of the noise field. We present a new Belgium Low-Noise Model (BLNM) and Belgium High-Noise Model (BHNM) that will be useful for future seismometers implementation in Belgium and to improve the detectability by the national network.

We specifically investigate the geographical variation of microseims measurements produced by Hurricane Ophelia during October 2017 (9 October – 20 October 2017) and track its progression in the North Atlantic Ocean. A specific focus is the Membach underground laboratory and station, host of multiple seismometers and gravimeters, where large-n ambient seismic noise-based experiments will take place in 2018 (Brain.be project LARGE-MEM).