Geophysical Research Abstracts
Vol. 19, EGU2017-16405, 2017
EGU General Assembly 2017
© Author(s) 2017. CC Attribution 3.0 License.

Relation between ocean wave parameters and primary microseismic noise

Carina Juretzek (1,2) and Celine Hadziioannou (1,2)
(1) University of Hamburg, Institute of Geophysics, Hamburg, Germany, (2) LMU Munich, Geophysics, Munich, Germany

Primary microseismic noise (12-15 second period) is mainly generated in shallow water. A theoretical framework for the Rayleigh wave generation exists, however the strong presence of Love waves in the primary microseism cannot be explained by this theory alone.

In this study, we explore the relation between ocean wave parameters, local parameters of the noise source regions, and the properties of the surface seismic noise field. We consider 3 months of data in 2008/2009 and the full year for 2013, for 3 arrays in Europe. The main source regions for each Love and Rayleigh waves are localized and compared to ocean surface elevation, ocean wave propagation direction and local bathymetry.

We find that beamformer results as well as correlation with ocean surface elevation show differences between noise strength of each wavetype emitted from the same coastal sections. Further, the British Isles and some parts of the coast of Norway serve as especially bright sources, meaning that they seem relatively more effective at noise generation. While both Rayleigh and Love wave noise amplitudes depend equally on the ocean surface elevation, we find a dependence of the wavetype ratio on ocean wave propagation direction. This hints towards an effective source radiation pattern and could provide insight into the source mechanism.