



Seismic noise sources inferred from dense onshore and offshore deployments in Portugal

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Two dense deployments of broadband seismic stations covered onshore and offshore Portugal in recent years. Project NEAREST deployed a total of 24 ocean bottom seismometers (OBSs) offshore southwest Portugal, in the Gulf of Cadiz, for 11 months (2007-2008). Project WILAS collected data from a total of 52 stations, both permanent and temporary, in mainland Portugal for 2 years (2010-2012). Both deployments have inter-station spacings on the order of 50 km. Although the two deployments did not overlap on time, both contain clear oceanic and atmospheric signatures.

We use the two datasets to characterize the seismic noise recorded in Portugal and to infer information on their sources. OBS data shows very clear correlations with local atmospheric and oceanic conditions, as well as with distant oceanic disturbances. Noise in the band 3-4 sec is strongly correlated with atmospheric disturbances, particularly with pressure drops. The primary and secondary microseisms are correlated with both local and distant storms. Some north Atlantic storms end at the Portuguese coast, causing the highest levels of microseismic noise recorded on our OBSs. We will present the signature on seismic records of one of these storms as it evolves from its origin to the Portuguese coast. Land data shows a strong correlation with oceanic conditions, particularly in the microseismic passband. During particularly quiet periods (i.e. northern summer) a strong atmospheric signal can be seen in the long periods, including a clear bi-diurnal periodicity.

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