Geophysical Research Abstracts
Vol. 17, EGU2015-13196-1, 2015
EGU General Assembly 2015

Seismic noise recored by seafloor observatories at Mediterranean sites

Mariagrazia De Caro, Stephen Monna, Francesco Frugoni, Laura Beranzoli, and Paolo Favali
Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy (mariagrazia.decaro@ingv.it)

The Mediterranean region is an area highly exposed to geo-hazards, such as seismic and volcanic activity. Real-time and continuous monitoring of its coastal areas is needed to ensure rapid warning and mitigate the effects of natural disasters. Seafloor observatories for near-real-time and real-time interactive long-term monitoring of ocean processes which are part of the EMSO (European Multidisciplinary Seafloor and water-column Observatory, www.emso-eu.org) Research Infrastructure, have been deployed in sites of the Mediterranean basin. We present long-term time series acquired by GEOSTAR-class seafloor observatories deployed in four sites of Mediterranean areas: Ionian and Tyrrhenian Seas (deep seafloor Central-Mediterranean sites) and the Marmara Sea and Gulf of Corinth (shallow seafloor Eastern-Mediterranean sites). We generated a reference model of the background seismic noise based on data collected from seismometers installed on board seafloor observatories. We concentrate on interesting and peculiar features of the noise signal in the frequency band 0.003-50 Hz. The main contribution in the short period band >5Hz (<2s) comes from anthropic noise (e.g. shipping noise). In this band we also find a peak around 0.8Hz (1.25s) which appears to be a persistent characteristic of the Mediterranean basins. Seasonal variations (summer-winter) are visible in the microseismic band 0.05-0.5Hz (2-20s). In particular in the Ionian and Tyrrhenian deep seafloor sites we can distinguish the splitting of the DF (Double Frequency peak) in the long period (LPDF) and the short period (SPDF) peaks. Our study shows the presence of the LPDF, well visible at the deep seafloor sites, and seasonal variations of the LPDF and the SPDF amplitudes ratio, suggesting that the SPDF depends on the sea wave regime generated by local winds. For the deep seafloor sites we can also appreciate the contribution of infragravity waves (<0.05Hz). Our observations confirm the dependence of the infragravity wave peak frequency on water depth.