Geophysical Research Abstracts
Vol. 14, EGU2012-8756, 2012
EGU General Assembly 2012

Monitoring of gas emission in the Marmara Sea by the combined study of the Acoustic Bubble Detector and Ocean Bottom Seismometers

G. Bayrakci (1), C. Scalabrin (1), I. Leblond (2), L. Geli (1), and J-B. Tary (3)
(1) Ifremer, Brest, France (gayebayrakci@ifremer.fr), (2) Ensta, Bretagne, France, (3) University of Alberta, Canada

We here present geophysical evidence of gas emission from the Sea of Marmara seafloor, recorded by an Acoustic Bubble Detector (BOB), deployed on the top of the Central High, giving insight on the temporal variations of the flow rates. The instrument insonified 24 sectors of 7° over several days, providing multiple passes for a given angular sector. The acquired data indicate that gas emissions are non-steady processes. Non-seismic micro events have also been identified on an ocean bottom seismometer (OBS) deployed at the same location as the BOB. These non-seismic micro-events have the same characteristics as the ones previously identified within the Tekirdag Basin, by a network of 4-component OBS: They were recorded by geophones, but generally not by the hydrophones, except when the hydrophone is located less than a few tens of cm above the seafloor. They are characterized by short durations of less than 0.6 seconds, by frequencies ranging between 5 and 30 Hz, and by highly variable amplitudes. In addition, no correlation was observed between OBSs. The presence of gas in superficial sediments, together with analogies with laboratory experiments, suggest that gas migration followed by the collapse of fluid-filled cavities or conduits could be the source of the observed micro-events. The present work combines the BOB recordings with the OBS recordings covering the whole North Marmara Trough. Our study shows that the monitoring of the gas emission by a multi parameter approach may provide valuable information to better understand the relationships between deformation and non-seismic transients related to degassing from the sub-seafloor layers near the fault zone.