Geophysical Research Abstracts
Vol. 20, EGU2018-19734, 2018
EGU General Assembly 2018

Exploring low-frequency sea level oscillations in the Mediterranean Sea: evidences from coastal observatories

Vesna Bertoncelj (1), Dusan Zagar (1), Davide Bonaldo (2), and Matjaz Licer (3)

(1) Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia, (2) Institute of Marine Sciences, National Research Council, CNR-ISMAR, Venice, Italy, (3) National Institute of Biology, Marine Biology Station Piran, Slovenia

Due to the growing awareness of the potential threats affecting low-lying coastal zones, combined with the strong coastal pressure on the littoral areas, a thorough knowledge of all the factors controlling sea level, especially in the case of severe storm events, is increasingly required to properly design coastal defences, provide accurate forecasting and implement appropriate countermeasures. In fact, in some cases such as the historical coastal cities such as Venice (Italy) or Piran (Slovenia), a few centimetres increase in sea level implies the incremental flooding of relevant portions of the city centre, with possible significant implications in terms of damage to the private property or to the cultural heritage. With this urge in mind, in the present study we aim at characterising the extent, the timing and the amplitude of barotropic free modes of oscillation throughout the Mediterranean basin.
To this scope, we carried out an analysis of sea level time series collected from a number of coastal observatories in the Mediterranean Sea. We first carried out a wavelet analysis for each sea level record, aiming at identifying the events in which the signature of sub-inertial barotropic oscillations is observed with a sufficient spatial coverage. Then we carried out spectral analysis on selected events, in order to characterise the properties of the observed signals.
Preliminary results provide information about the spatial distribution of the amplitude and phase of the signals, as well as the identification of the events in which these oscillations exhibit special intensity. This sets the ground for a deeper investigation of signal propagation throughout the basin and in particular across the continental margin to the coastal zones, as well as a characterisation of the large scale metocean forcings triggering the process, also in the framework of a climate change perspective.