



Past sea level reconstruction and variability of sea level trend patterns over 1970-2001 in the Mediterranean Sea basin derived from Altimetry and 2 long OGCM runs.

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For the past decades, there are no direct basin-scale sea level observations concerning the spatial sea level patterns and their evolution in the Mediterranean Sea. In order to understand physical processes driving sea level variability it is important to know the dominant modes of regional variability on interannual/decadal/multidecadal time scale in the Mediterranean basin. It is also of interest for assessing ocean circulation models dedicated to the Mediterranean Sea. For these purposes, we have developed a reconstruction method of past Mediterranean sea level (since 1970) that combines long tide gauge records of limited spatial coverage and 2-D sea level patterns based on the AVISO altimetry dataset and on runs from two different Ocean General Circulation Models (OGCMs). In the latter case, we use runs from the ORCA05 model (without data assimilation) over 1958-2005 available from the DRAKKAR project and the SODA reanalysis over 1958-2005 available from GODAE (Carton et al., 2008), assimilating all available in situ temperature, salinity and sea level data. We also perform the past sea level reconstruction over the Mediterranean Sea using 2-D spatial patterns from satellite altimetry.

The three sea level reconstructions are inter-compared, together with results from a published study (Calafat and Gomis, 2009). The dominant modes of temporal variability are discussed and sea level hindcasts at tide gauge sites not used in the analysis are compared to actual observations. Comparisons with steric sea level patterns based on in situ hydrographic data are also presented and discussed with regard to the conclusions of past studies based on tide gauge records analysis.