



Steric sea level variations in the Mediterranean Sea during the last decade

Karina von Schuckmann (1), Giulio Notarstefano (2), Pierre Poulain (2), Isabelle Taupier-Letage (3), Louis Prieur (4), and Nicolas Reul (1)

(1) IFREMER, LER/LOS, La Seyne sur Mer, France (karina.von.schuckmann@ifremer.fr), (2) OGS, Trieste, Italy , (3) CNRS/Ifremer, La Seyne sur Mer, France, (4) CNRS/LOV, Villefranche sur Mer, France

Understanding the regional dominant modes of sea level variability and assessing the potential regional impacts of sea level rise is particularly important in vulnerable populated area such as the Mediterranean basin. Previous studies have shown that a significant part of these regional variations can be explained by the geographical variations of ocean volume changes. We have used a re-qualified in situ data set during the years 2001-2011 to analyze interannual to decadal variations of Mediterranean steric sea level at basin-wide and regional scale. The dataset was built combining the temperature and salinity profiles from Argo floats, and from data collected by recent scientific cruises and historical data belongings to several Mediterranean oceanographic campaigns. A method based on a simple box averaging scheme is developed, where boxes have been defined related to general circulation properties of the Mediterranean basin, including uncertainty estimation. This method is easy to implement and run and can be used to set up a routine monitoring of the Mediterranean basin. Moreover, the in situ temperature and salinity measurements are used to identify the role of thermosteric and halosteric sea level changes at basin and regional scale, and at different depth layers. We also present examples of Mediterranean steric sea level variations that include the basin-wide mean rise, and main patterns of regional variability, including those related to the thermohaline circulation of the basin.