



The steric contribution to annual sea level change in the Mediterranean Sea

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We examine temperature and salinity data from climatologies and from ocean model data with the aim of quantifying the steric contribution to the annual sea level variability in the Mediterranean Sea.

The annual steric sea level variability is driven by the thermo-steric changes in the heat content in the upper 0-100 metres. The basin average over the Mediterranean Sea peaks in September for all databases. A significant difference appears however in its annual amplitude, with values between 43 to 59 mm corresponding to a contribution between 50 and-75% of the annual amplitude of the basin average sea level evaluated from altimetry (83 mm). Analysis of the spatial distribution show changes up to 20 days in the phase and up to 20% in the amplitude. The annual amplitude present inter-annual changes.

The basin average results are tested by comparison with the steric sea level change estimated as difference of total sea level change and water mass change by combining Jason-1 altimeter, GRACE and continental hydrology data in 2003-2006.