



Use of a multi-platform approach to understand sea level altimetry signals in the Ligurian Sea (Northwestern Mediterranean Sea)

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During the Long-Term Glider Mission for Environmental Characterization 2016 sea trial, carried out in the eastern Ligurian Sea (Northwestern Mediterranean Sea), two gliders operated continuously from 3 May 2016 to 27 June 2016. Temperature and salinity measurements co-localised with the passages of Jason-2 and SARAL/AltiKa were used to calculate along-track dynamic heights (DH). The latter were then compared with the altimeters' absolute dynamic topography (ADT) measurements. In order to compensate for the lack of synopticity between DH and ADT estimates, a glider DH relocation algorithm based on the observed dynamic was developed and tested using the collected dataset. This new approach increased the correlation between DH and ADT to almost 1 and reduced the RMSE of an order of magnitude, also when the time-difference between datasets was greater than 3 days. Consequently, we associated the observed sea level spatial and temporal variability to the presence of northwards moving meanders generated by the baroclinic instability of the Liguro-Provençal Current. Sea level relative minima and maxima have been found dependent on the occurrence of Modified Atlantic Water and of waters with Tyrrhenian Sea origin. The relocation technique introduced here and further tested with glider and altimetry datasets that have become available in 2017 and 2018, could contribute to future altimetry-glider comparisons, as to date, these validation efforts have been considered possible only when glider and altimetry measurements were co-located and near synoptic.