Quality assessment of altimeter data through tide gauge comparisons

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Since the first altimeter missions and the improvements performed in the accuracy of sea surface height measurements from 1992 onwards, the importance of global quality assessment of altimeter data has been increasing. Global CalVal studies usually assess this performance by the analysis of internal consistency and cross-comparison between all missions. The overall quality assessment of altimeter data can be performed by analyzing their internal consistency and the cross-comparison between all missions.

As a complementary approach, tide gauge measurements are used as an external and independent reference to enable further quality assessment of the altimeter sea level and provide a better estimate of the multiple altimeter performances. In this way, both altimeter and tide gauge observations, dedicated to climate applications, require a rigorous quality control. The tide gauge time series considered in this study derive from several networks (GLOSS/CLIVAR, PSMSL, REFMAR) and provide sea-level heights with a physical content comparable with altimetry sea level estimates.

Concerning altimeter data, the long-term drift assessment can be evaluated thanks to a widespread network of tide gauges. Thus, in-situ measurements are compared with altimeter sea level for the main altimeter missions. If altimeter time series are long enough, tide gauge data provide a relevant estimation of the global Mean Sea Level (MSL) drift calculated for all the missions. Moreover, comparisons with sea level products merging all the altimeter missions together have also been performed using several datasets, among which the AVISO delayed-time Sea Level Anomaly grids.