Improvements in the Validation Techniques Applied to Tide Gauge and Altimetry Observations of Coastal Sea Level Rates

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The validation of coastal altimetry sea level products against in situ tide gauge measurements is an essential part of verifying altimetric sea level observations and characterising their errors. The recent introduction of specialised retrackers, such as the Adaptive Leading-Edge SubWaveform (ALES), has raised the possibility of retrieving good-quality altimetry data closer to the coast. One way to assess these new data is via altimetry-tide gauge comparisons, but this is complicated by the fact that altimetry measurements are rarely collocated with tide gauge stations, which gives rise to discrepancies between the two due to spatial separation. These discrepancies will be necessarily smaller in regions where sea level signals vary coherently over long length scales and so tide gauges located in such regions will provide a more reliable assessment of altimeter sea level data performance. Here, as part of a study conducted within the framework of the ESA Sea Level Climate Change Initiative (SL_cci), we identify regions of long sea level trend length scales using data from both the high-resolution NEMO (1/12 degree) global ocean model and altimetry in order to improve the validation technique for assessing the performance of coastal altimetry sea level rates. To this aim, the tide gauges are sorted into groups according to their decorrelation values. The performance of the coastal altimetry observations is then assessed for each group of tide gauges separately. We report on the methodology and the outcome of these results in three selected regions in the North Sea, the Mediterranean Sea and coast of West Africa.

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