Salinity variability in satellite subpixels: impact on satellite in-situ comparisons

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Salinity variability in satellite subpixels: impact on satellite in-situ comparisons.

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Sea Surface Salinity (SSS) are retrieved from SMOS and SMAP L-band radiometers at a spatial resolution of about 50km.

Traditionally, satellite SSS products validation is based on comparisons with in-situ near surface salinity measurements.

In-situ measurements are performed on moorings, argo floats and along ship tracks[JB1] , which provide punctual or one-dimensional (along ship tracks) estimations of the SSS.

The sampling difference between one-dimensional or punctual in-situ measurements and two-dimensional satellite products results in a sampling error that must be separated from measurement errors for the validation of satellite products.

We use a small-scale resolution field (1/12° Mercator Global Ocean Physics Analysis and Forecast) to estimate the expected sampling error of each kind of in-situ measurements, by comparing punctual, [JB2] one-dimensional and two-dimensional SSS variability.

The better understanding of sampling errors allows a more accurate validation of satellite SSS and of the errors estimated by satellite retrieval algorithms. The improvement is quantified by considering the standard deviation of satellite minus in-situ salinities differences normalized by the sampling and retrieval errors. This quantity should be equal to one if all the error contributions are correctly considered. This methodology will be applied to SMOS SSS and to

merged SMOS and SMAP SSS products.