

## SSS SMOS/SMAP OI L4 maps

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6 April 2020

### **Overview:**

10 years of L-Band remote sensing Sea Surface Salinity (SSS) measurements have proven the capability of satellite SSS to resolve large scale to mesoscale SSS features in tropical to subtropical ocean. In mid to high latitude, L-Band measurements still suffer from large scale and time varying biases. Here, a simple method is proposed to mitigate the large scale and time varying biases. First, in order to estimate these biases, an Optimal Interpolation (OI) using a large correlation scale is used to map SMOS and SMAP L3 products and is compared to equivalent mapping of in situ observations. Then, a second mapping is performed on corrected SSS at scale of SMOS/SMAP resolution (~45 km). This procedure allows to correct and merge both products, and to increase signal to noise ratio of the absolute SSS estimates. Using thermodynamic equation of state (TEOS-10), the resulting L4 SSS product is combined with microwave satellite SST products to produce sea surface density and spiciness, useful to fully characterize the surface ocean water masses. The new L4 SSS products is validated against independent in situ measurements from low to high latitudes. The L4 products exhibits a significant improvement in mid-and high latitude in comparison to the existing SMOS and SMAP L3 products. However, in the Arctic Ocean, L-Band SSS retrieval issues such as sea ice contamination and low sensitivity in cold water are still challenging to improve L-Band SSS data.

### Acknowledgments:

The SMOS/SMAP OI L4 maps was provided and supported by the CNES CATDS and CNES TOSCA SMOS OCEAN project.

### How to cite:

Kolodziejczyk Nicolas, Hamon Mathieu, Boutin Jacqueline, Vergely Jean-Luc, Supply Alexandre, Reverdin Gilles (2020). SSS SMOS/SMAP OI L4 maps. SEANOE. <https://doi.org/10.17882/73142>

In addition to properly cite this dataset, it would be appreciated that the following work(s) be cited too, when using this dataset in a publication :

Kolodziejczyk, N., Hamon, M., Boutin, J., Vergely, J., Reverdin, G., Supply, A., & Reul, N. (2021). Objective Analysis of SMOS and SMAP Sea Surface Salinity to Reduce Large-Scale and Time-Dependent Biases from Low to High Latitudes, *Journal of Atmospheric and Oceanic Technology*, 38(3), 405-421. <https://doi.org/10.1175/JTECH-D-20-0093.1>