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Towards SMOS L4 SSS products: Improving L3 SSS with auxiliary SSS data

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The Soil Moisture and Ocean Salinity (SMOS) mission will provide for the first time remote sensing observations of sea surface salinity (SSS). The SMOS SSS dataset will have an averaged spatial resolution of 40km and a maximum revisiting time of 3 days, so the amount of available data will be large. However, several authors have suggested an observational error value of 0.85 psu. (Philipps et al., 2007; Sabia et al, 2008). That error is by far too large to obtain a direct profit from SMOS data. GODAE recommends for instance an accuracy of 0.1 psu for SSS products, and therefore some data treatment is required to increase the accuracy of SMOS products.

The level 3 (L3) of the SMOS processing chain focuses on the generation of gridded SSS products. These L3 products will summarize large amounts of SMOS data in coarse resolution maps with reduced errors (Jordà and Gomis, 2009). An additional way to improve these products is to combine them with auxiliary data coming from other observational programs such as Argo profilers, ships of opportunity or buoys. These auxiliary data usually have a partial spatial or temporal coverage but a much better accuracy ($\tilde{0}$.01psu) than SMOS data. Therefore, these datasets are complementary to the SMOS dataset and could be merged at a subsequent level 4 (L4) of the processing chain. Such merging would, at least partially, overcome the trade-off between accuracy and spatial/temporal resolution that affects SSS products obtained only from SMOS observations.

In this contribution, we present the merging procedure and several examples of L4 products. The aim is to describe and to quantify the benefits of using different kinds of auxiliary datasets to improve SMOS L3 products.