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Topic: Salinity Products and Cal/Val

Title: Novel Global and Arctic SSS Fields Developed at CATDS CEC-OS

Abstract: The Ocean Salinity Center of Expertise for CATDS (CATDS CEC-OS) works at improving methodologies for SMOS mapped sea surface salinities, that are next implemented in the near real time CATDS processing chain (CATDS-CPDC). In this poster, we present recent updates in the global and Arctic CATDS fields.

Global SSS maps currently distributed by the CATDS CEC-OS (V10) covers the period January 2010-December 2024. The temporal optimal interpolation with a bias removal depending on the SMOS observation geometry (see a general description in [Boutin *et al.*, 2018]) is similar to the one implemented in versions 8 and 9, but an additional correction related to the sun emission has been taken into account. As a result, the SSS interannual variability is better reproduced in the northern hemisphere. Validation reports of the product compared to various sources of in situ measurements are available at PIMEP (<https://www.salinity-pimep.org>). At global scale, without any filtering, r^2 between CEC v10 SSS and Argo delayed time SSS are 0.95 (9-day products) and 0.97 (18-day products), robust std of the difference is 0.25 (9-day products) and 0.18 (18-day products). In CATDS CEC-OS V11 (2010-2025), an additional correction for ice-sea contamination in the Southern Ocean is implemented and preliminary results will be presented.

Over the Arctic Ocean, the methodology originally derived by *Supply et al.* [2020] and implemented in CEC-LOCEAN ARCTIC V1 SSS maps has been revisited. In the CEC LOCEAN ARCTIC V2, 9-day and 18-day SSS maps are derived over the June 2010 to August 2023 period with a similar methodology but adding a temporal optimal interpolation with a bias removal depending on the SMOS observation geometry. Comparisons with independent in situ datasets, conducted in CEC LOCEAN and in PIMEP, indicate a clear improvement (reduction of std difference by ~a factor 2 and systematic increase of r^2); with V2.0 r^2 is greater than 0.8 with 40% of the data sets considered at PIMEP. As in V1, SSS maps are provided on an Equal-Scalable Earth Grid 2 (EASE 2) with a Northern Hemisphere Azimuthal projection and a resolution of 25km. These results lead to the development of a new operational chain for deriving a SMOS SSS Arctic product made routinely available by the CATDS operational center (CATDS-CPDC).

Reference Datasets:

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