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Title: Quality Report: Validation of SMOS-BEC experimental Sea Surface Salinity products in the Arctic Ocean and high latitudes Oceans. Years 2011-2013.

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QUALITY REPORT: VALIDATION OF SMOS-BEC EXPERIMENTAL SEA SURFACE SALINITY PRODUCTS IN THE ARCTIC OCEAN AND HIGH LATITUDES OCEANS. YEARS 2011-2013

Abstract: This technical note focuses on the comparison of the Sea Surface Salinity (SSS) of the SMOS-BEC experimental products in high latitudes Ocean and in the Arctic Sea currently distributed by BEC at http://cp34-bec.cmima.csic.es with respect to the SSS provided by Argo floats

Contents

1 INTRODUCTION

The aim of this technical note is to report the differences between the experimental SMOS SSS in high latitude Oceans and in the Arctic Ocean distributed by BEC and the Argo data. The BEC products have been generated from Level1B v620 processed by ESA. The maps are computed by means of an objective analysis scheme and they are distributed in a EASE (NL) spatial grid at 25km. The product accumulates SMOS salinities along 9 days and is distributed daily. These products are distributed by BEC from http://cp34-bec.cmima.csic.es. The structure of this technical note is the following. Section 2 describes how the SSS has been estimated from Argo profiles and the results are shown in section 3.

Table 1: Statistics of the comparison with Argo

Year	<Mean>	<STD>	<RMS>
2011	-0.05	0.32	0.35
2012	0.05	0.34	0.38
2013	0.04	0.25	0.29

2 ARGO

The SMOS-BEC products are compared in this section with in situ data. The statistical comparison is carried out with close-to-surface values acquired by Argo floats (Argo data is freely distributed by the CORIOLIS data center, http://www.coriolis.eu.org).

In particular, SSS values are being estimated from Argo data by interpolating the salinity profiles at 7.5m below the surface. To avoid extrapolation, only profiles with valid values at (at least) 5.5m depth are considered. For SOLO and PROVOR profiles, only data below 5 m depth are taken into account as their CTD probes do stop pumping water at arround 5 m below the surface ([Boutin et al., 2012]). The whole valid profile is used in the interpolation, with the exception of values taken above 0.5 m depth. As in [Ballabrera-Poy et al., 2009], interpolation artifacts are reduced by using three different interpolations methods: Akima splines ([Lancaster and Salkauskas, 1981]), cubic splines, and third order polynomial fitting ([Press et al., 1992]). The interpolated profile is obtained here by averaging the three methods, but profiles are rejected if any of the three interpolation schemes differs by more than the 5% from the average.

3 RESULTS

The results rely upon the basic statistics of the difference between the SMOS an the ARGO value at each cell. The values listed in the table 1 correspond to the average value of the mean, the standard deviation and the root mean square statistics with respect to the SMOS objective analyzed SSS during the years 2011, 2012 and 2013 separately. The time evolution of these statistics is shown in Figure 1.

References

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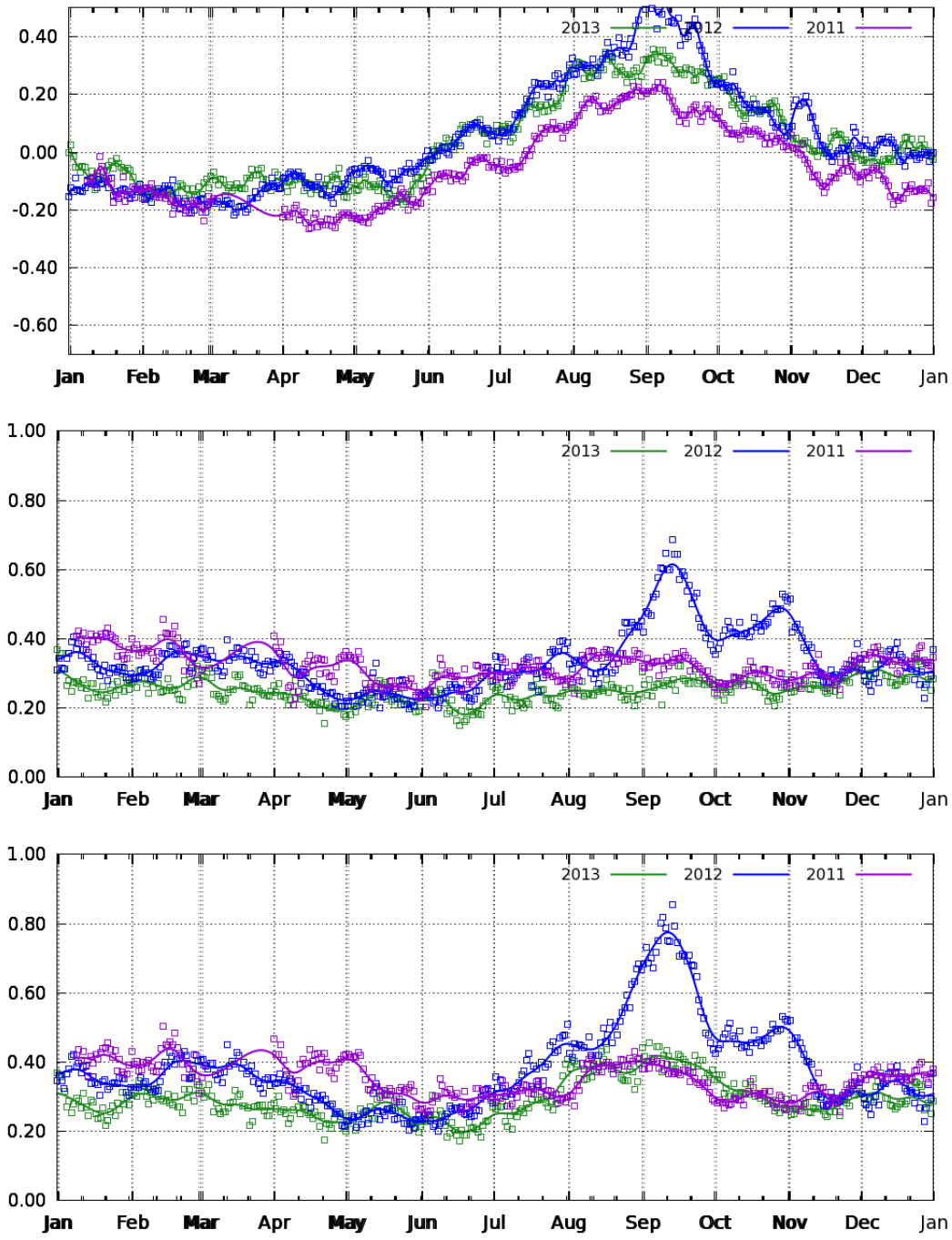

Figure 1: Differences of the SMOS objective analyzed SSS with respect to ARGO. From top to bottom: Mean of the differences; Standard Deviation of the differences; RMS of the differences