



SMOS SSS at Barcelona Expert Center: a new generation of products and applications

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The Barcelona Expert Center (BEC), created in 2007, is a European Space Agency (ESA) Expert Support Laboratory to SMOS missions at Levels 1 and 2. Since its beginning, BEC has provided support not only in calibration and validation activities, but also in the design and development of higher level products (Levels 3 and 4). Since 2013, BEC is the Spanish center in charge of the production of SMOS products, both on land and on ocean, and with the goal to expand its activities to other variables and missions (see <http://bec.icm.csic.es/>). The great advantage of BEC, as it integrates all the processing chain from level 1 to level 4, is that BEC products benefit of critical improvements in the processing at any level.

SMOS products have higher resolution, wider swath and much more acquisition angles than those provided by the two other L-band missions so far (NASA Aquarius and SMAP). However, due to the complexities in the processing of SMOS signal, the earlier versions of SMOS SSS products were deemed as less accurate and noisier than those of NASA missions, and were in particular much more affected by the presence of Radio Frequency Interferences and by Land-Sea contamination. Thanks to continuous efforts devoted by several European laboratories (IFREMER, LOCEAN, ACRI St, Argans, ODL and the own BEC) under the coordination of ESA, SMOS SSS products are now of high quality and the only source of remote sensing data providing a continuous record of synoptic SSS maps since 2010.

In this work, we will present the last generation of BEC SSS products, in which the main processing improvements have been incorporated. Thanks to them, BEC is now serving products with high spatial resolution (0.25° globally, 25 km of the Arctic region) and high time resolution (9-day at L3, 1-day at L4). The new products enable not only to get quality data very close to the coast, but to resolve river plumes and mesoscale features. The high quality of BEC SSS products and its repetitivity enables a wide variety of applications: tracking the evolution of basin-wide processes (Rossby wave, Tropical Instability Waves, fronts in the ACC, etc), assess the mesoscale transport and exchange of water properties, study the interaction of sea ice with sea water in the processes of ice formation and melting, the analysis of spectral slopes of salinity, the estimation of lateral diffusivities and a long etc.