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The SMOS L3 mapping algorithm for ocean salinity

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The launch of the Soil Moisture and Ocean Salinity (SMOS) mission will provide for the first time remote sensing observations of sea surface salinity (SSS). SMOS will provide SSS data with an averaged spatial resolution of 40km and a maximum revisiting time of 3 days. However, the observational error is expected to be large. The SMOS level 3 (L3) products aims to synthetize the large amount of information obtained as well as to increase the accuracy of the products. In this contribution we describe the SMOS L3 mapping algorithm for ocean salinity.

The chosen algorithm is Optimal Interpolation (OI; Gandin, 1963). OI is a robust technique that guarantees, in a statistical sense, the best estimation of the real field. Some elements must be provided to the algorithm: the background field (first guess), a spatio-temporal correlation model and the observational error covariances. For the background field we have chosen a climatology but other choices would be possible. For the correlation model we propose an elliptical Gaussian function which is a relatively simple way to account for inhomogeneities and anisotropies in the spatio-temporal correlations. The parameters of this model have been obtained from a realistic global ocean model. For the observational error covariances, we use the results of an L2 simulator to characterize them. Finally, an additional pre-filtering of L2 data has been included in the procedure for eficiency reasons. In our presentation, we discuss the implications of all those choices and we present some alternatives and proposals for future improvements.