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Salinity and water cycle: SMOS satellite and in situ observations of sea surface salinity

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The ESA/SMOS (European Space Agency/Soil Moisture and Ocean Salinity) satellite mission has been successfully launched in November 2009. Since then, it has been possible, after systematic biases corrections, to deduce SMOS sea surface salinity (SSS) that reproduce quite well at large scale expected SSS spatial variations. In the open ocean and for moderate wind speeds, comparisons of first SMOS SSS with in situ measurements have shown an accuracy on the order of 0.3-0.5pss-78 once SSS have been averaged over typical GODAE scales (10days-one month, 100kmx100km). During 2010, global SMOS SSS maps exhibit SSS anomalies patterns in reasonnable agreement with in situ measurements in western tropical Pacific Ocean and in intertropical zones, partly linked to the La Nina event. Nevertheless, in the current real time processing, flaws have been identified that are under study for further correction/improvement: e.g., biases close to the coast depending on the satellite orbit orientation, biases at large wind speed, temporal biases. In addition, SMOS data are affected by L-band radio-frequency interferences in particular in the northern Atlantic, Pacific and Indian Ocean, leading to non-existent or degraded SSS retrievals in these regions. In this poster, we will give an overview of SMOS SSS status performed using SMOS SSS retrieved with updated processings. SMOS SSS comparisons with in-situ SSS will be performed using measurements from sea surface drifters measuring SSS at about 50cm depth (see Reverdin et al. poster), ships of opportunity (see Delcroix et al. poster) and ARGO floats SSS recorded in the first 10m depth. Since comparisons of preliminary SMOS SSS with in situ SSS in rainy regions seem to indicate fresher SMOS SSS, a particular focus will be put into rainy regions in order to evaluate the effects of vertical stratification (SMOS L-band radiometer measurements sample only the first top centimeter of the sea surface) and of the satellite temporal undersampling (SMOS repeat period is between 3 and 5 days) onto the monitoring of SSS variability using L-band satellite radiometry with respect to other in situ measurements.