Ocean CAL/VAL activities in Hamburg

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Introduction
Ocean salinity is a key variable in the determination of ocean circulation and the water cycle. It is an important circulation tracer for water masses. Sea surface salinity fields and their seasonal and inter-annual variability are the driving variables for the water cycle and for coupled ocean-atmosphere models. The link between sea surface salinity and sea surface temperature distributions is a key element in ocean dynamics.

Cal/Val activities at Institut für Meereskunde in Hamburg will focus on validating SMOS sea surface salinity retrievals.

AMSRE, Ecco-Model, Climatology
As a preparation to SMOS data analysis, we studied SST variations from AMSR-E and in a numerical simulation and (left) the difference to Levitus climatology and space and time scales of SST and SSS variability. Investigating these variabilities should help us to find regions for in-situ measurements to evaluate SMOS SSS with drifter and ARGO data.

Temperature
Amplitude, phase and standard deviation in the Polar Seas without annual cycle of SST from AMSR-E (time period 2002-2006 of one grid cell).

Salinity
Mean and STD of SSS variations available from left the Levitus climatology and (right) an numerical simulation.

Polarstern, ARGO Data
To understand the spatial scales and amplitudes of SSS variations present in the ocean, under way measurements of SSS from the German RV POLARSTERN were analyzed. Also analyzed were differences between ARGO measurements and Levitus SSS climatology.

Planned Activities
Activities planned for the next years as part of the CAL/VAL effort include:
- Obtain measurements of SSS from 25 surface drifters deployed in the Polar Seas and in the western Pacific warm pool region. Drifter will be deployed during spring 2010.
- Compare SMOS SSS with measurements obtained from surface drifters as well as from POLARSTERN.
- Comparison of ARGO SSS with SMOS fields over the global ocean. This comparison will especially investigate the high latitudes, but also all other regions of the world ocean.
- Compare SMOS data with model results.
- Assimilate SMOS data into a global ocean circulation model.