Geophysical Research Abstracts,
Vol. 11, EGU2009-10348, 2009
EGU General Assembly 2009


# Global Surface Salinity Variability: Modal Characterization

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The Soil Moisture and Ocean Salinity (SMOS) mission of the European Space Agency will provide global surface salinity (SSS) observations starting in 2009. The development and validation of satellite SSS products requires an adequate understanding of the salinity variability at global scales. In this study, a preliminary characterization of the surface salinity variability for the global ocean using both observed and model data is accomplished. A comparison with surface temperature (SST) characteristics is also conducted. Recent ARGO profiles (2004-2008) are used as observational data while the model data is obtained from hindcast simulations (2003-2008) from available prediction systems. Single-variate Empirical Orthogonal Functions (EOF) are estimated for both model and observed temperature and salinity. To achieve a more complete observational temporal and spatial distribution, gap filling is conducted using EOFs through an iterative process to project the available ARGO information.
The avoid the overwhelming effect of the Arctic SSS variability on the EOF analysis, that region is separated from the model-observation comparison. The modes of variability from model data presents both spatial and temporal similarities with observational data, especially for surface temperature. The main mode of variability in both SSS and SST is likely associated with the ENSO cycle. Additionally, Single- and Multivariate EOFs can be used to propagate information (gap filling) from data rich variables (SST) or areas to regions where SSS data is sparse.
This work is part of the SMOS Barcelona Expert Center (http://www.smos-bec.icm.es) effort to contribute to the ground segment of the SMOS mission.