Geophysical Research Abstracts,
Vol. 11, EGU2009-12696, 2009
EGU General Assembly 2009

Salinity Gradients at the Ocean Surface: Consequences for Satellite-Derived Salinity Fields

B. Ward (1), G Reverdin (2), J. M. Lilly (3), and R. W. Schmitt (4)

(1) National University of Ireland, Galway, Physics, Galway, Ireland (bward@nuigalway.ie), (2) Laboratoire d'Océanographie Expérimentation et Approches Numériques, CNRS, UPMC, IRD, Paris, France, (3) Earth and Space Research, Seattle, WA, USA, (4) Woods Hole Oceanographic Institution, Woods Hole, USA

In order to validate the spaceborne measurement of sea surface salinity, in-situ data from drifters, moorings, and floats will be used. However, these in-situ measurements are usually made at several meters below the surface, whereas the SMOS satellite will measure the salinity in the upper centimeter. Our objective is to investigate the magnitude of the salinity gradients in the upper 10 m of the ocean, and under which conditions they are most likely to occur. We are proposing to conduct this research using the Air-Sea Interaction Profiler (ASIP).

ASIP is an autonomous, upwardly-rising instrument with a suite of high-resolution sensors. The most important sensor on ASIP is the diamond-coated conductivity/temperature microsensor, which is currently being developed using semiconductor fabrication techniques. With this new sensor on ASIP, we will be able to resolve the salinity gradient with a resolution of 1 mm.

Data from the proposed measurements will be invaluable in order to understand the relationship between SSS (i.e. the salinity at 1 cm), and a 'bulk' salinity measurement. These data will also highlight the conditions where salinity gradients are expected to exist: evaporation, precipitation, and during low wind speeds where a salty layer may be stabilized when there is significant shortwave warming at the ocean surface. These studies will lead to an overall improvement in the accuracy of the satellite-derived salinity measurements, thereby increasing our ability to monitor the ocean's influence on climate.