The 36th International Symposium on Remote Sensing of Environment,
11 – 15 May 2015, Berlin, Germany, ISRSE36-332

IMPROVING THE ALTIMETER DERIVED GEOSTROPHIC CURRENTS USING HIGH RESOLUTION SEA SURFACE TEMPERATURE IMAGES: A FEASABILITY STUDY.

M.-H. Rio [a, *], R. Santoleri [a], A. Griffa[b], L. Piterbarg[c]

[a] ISAC-CNR, Via Fosso del Cavaliere 100, 00133 Rome, Italy – mariehelene.rio@artov.isac.cnr.it
[b] ISMAR-CNR, La Spezia, Italy – agriffa@rsmas.miami.edu
[c] University of Southern California, Pasadena, USA – piter@usc.edu

THEME: Marine and coastal environment, resources and dynamics

KEY WORDS: ocean currents, altimetry, sea surface temperature, OSSE

ABSTRACT:

Accurate knowledge of spatial and temporal ocean surface currents at high resolution is essential for a variety of applications. The altimeter observing system, by providing global and repetitive measurements of the Sea Surface Height (SSH), has been by far the most exploited system to estimate and monitor ocean surface currents in the past 20 years. However it does not allow observing currents departing from the geostrophic equilibrium, nor is capable to resolve the shortest spatial scales of the currents. In order to go beyond these limits, new sensors and new methodologies must be explored. In this study, we investigate how the high spatial and temporal resolution information from Sea Surface Temperature (SST) images can improve the altimeter derived currents by adapting a method first proposed by Piterbarg et al (2009). It consists in inverting the SST evolution equation for the velocity by prescribing the source and sink terms and by using some background information (here the altimeter derived geostrophic currents) in order to remove the uncertainty of the along-gradient velocity. The method feasibility is tested using an Observing System Simulation Experiment (OSSE) based on model outputs from the Mercator-Ocean system.

* Corresponding author. This is useful to know for communication with the appropriate person in cases with more than one author.