Geophysical Research Abstracts
Vol. 15, EGU2013-9907, 2013
EGU General Assembly 2013

The Solomon Sea eddy activity from a 1/36° regional model

Bughsin Djath (1), Antoine Babonneix (2), Lionel Gourdeau (2), Frédéric Marin (3), and Jacques Verron (1)
(1) LEGI, CNRS/Université Joseph Fourier, Grenoble, France, (2) LEGOS, IRD/Université Paul Sabatier, Toulouse, France, (3) LEGOS, IRD, Nouméa, Nouvelle-Calédonie/France

In the South West Pacific, the Solomon Sea exhibits the highest levels of eddy kinetic energy but relatively little is known about the eddy activity in this region. This Sea is directly influenced by a monsoonal regime and ENSO variability, and occupies a strategical location as the Western Boundary Currents exiting it are known to feed the warm pool and to be the principal sources of the Equatorial UnderCurrent. During their transit in the Solomon Sea, meso-scale eddies are suspected to notably interact and influence these water masses.
The goal of this study is to give an exhaustive description of this eddy activity. A dual approach, based both on altimetric data and high resolution modeling, has then been chosen for this purpose. First, an algorithm is applied on nearly 20 years of 1/3° x 1/3° gridded SLA maps (provided by the AVISO project). This allows eddies to be automatically detected and tracked, thus providing some basic eddy properties. The preliminary results show that two main and distinct types of eddies are detected. Eddies in the north-eastern part shows a variability associated with the mean structure, while those in the southern part are associated with generation/propagation processes.
However, the resolution of the AVISO dataset is not very well suited to observe fine structures and to match with the numerous islands bordering the Solomon Sea. For this reason, we will confront these observations with the outputs of a 1/36° resolution realistic model of the Solomon Sea. The high resolution numerical model (1/36°) indeed permits to reproduce very fine scale features, such as eddies and filaments. The model is two-way embedded in a 1/12° regional model which is itself one-way embedded in the DRAKKAR 1/12° global model. The NEMO code is used as well as the AGRIF software for model nestings. Validation is realized by comparison with AVISO observations and available in situ data.
In preparing the future wide-swath altimetric SWOT mission that is expected to provide observations of small-scale sea level variability, spectral analysis is performed from the 1/36° resolution realistic model in order to characterize the finer scale signals in the Solomon sea region. The preliminary SSH spectral analysis shows a k-4 slope, in good agreement with the suface quasigeostrophic (SQG) turbulence theory.

Keywords: Solomon Sea; meso-scale activity; eddy detection, tracking and properties; wavenumber spectrum.