



Study of the Leeuwin Current from JASON-1 high rate Altimeter SLA processed with the X-TRACK software

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Satellite data are part of the ocean monitoring systems for years, providing steady and accurate measurements. However, these data are often missing or unexploited in the coastal area, leading to important gaps in coastal observing system. This lack of data is partially due to an important amount of existing measurements flagged by standard processing. Indeed, the accuracy of altimeter data decreases over shallow-waters and data within 50km off the coast are usually not available in the official products.

Recent studies have demonstrated that a large amount of data flagged in official products can be recovered in marginal seas and above continental shelves (Vignudelli, 2005). In this context, the Centre de Topographie des Océans et de l'Hydrosphère (CTOH), a french observation service dedicated to satellite altimetry, in collaboration with different research teams, has developed a new data processing system specifically designed to provide more altimeter data on coastal seas: the X-TRACK software. This processing tool has shown its capacity to improve data availability near the coastline, with strong error reductions compared to AVISO standard products (Bouffard, 2008).

In this study, we aim to determine what new insights high sampling rate X-TRACK data could bring on the inshore and offshore dynamics in the South-West Australia. This region is of particular interest, as the Leeuwin Current (LC), an atypical current flowing polewards along the west coast of Australia, is not yet well understood. If X-Track data are able to capture a coherent dynamical signal, associated to coastal processes along the south-West coast of Australia, it could help to improve our knowledge of this boundary current and bring a long-time database to monitor the interannual variability of the LC.

X-Track data have here been validated through a comparison with AVISO SLA and SST from AVHRR. The work shows that X-Track reproduces correctly the LC dynamics and mesoscale processes. Firstly developed for inshore applications, this study demonstrates that X-Track data are also reliable offshore, bringing further informations than the classical products. Hence, this data set is used to study the seasonal and interannual variability of the LC and its eddies. This work underlines the potential of high-resolution altimetry in the studied region, as previously shown for the Mediterranean Sea (Birol, 2010).

References

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