Charles
Troupin
IMEDEA (UIB-CSIC)
Arancha Lana, IMEDEA (UIB-CSIC)
Ananda Pascual, IMEDEA (UIB-CSIC)
Poster
The spatial interpolation of Sea-Level Anomalies (SLA) along-track data to produce gridded map has numerous applications in oceanography, such model validation, data assimilation or eddy tracking. Optimal Interpolation (OI) is often the preferred method for this task, as it leads to the lowest expected error and provides an error field associated to the analyzed field. However, the numerical cost of the method (due to the inversion of covariance matrices) as well as the isotropic covariance function, generally employed in altimetry, may stand in the way of a systematic application to SLA data.

The Data-Interpolating Variational Analysis (DIVA) is a gridding method based on the minimization of a cost function using a finite-element technique. The cost function penalizes the departure from observations, the smoothness or regularity of the gridded field and can also include physical constraints (advection, diffusion, ...). It has been shown that DIVA and OI are equivalent (provided some assumptions on the covariances are made), the main difference is that in DIVA, the covariance function is not explicitly formulated. The technique has been previously applied for the creation of regional hydrographic climatologies, which required the processing of a large number of data points.

In this work we present a implementation of Diva for generating high-resolution daily maps of SLA, ADT and geostrophic currents in the Mediterranean Sea. The procedure for the productions of the gridded products is as follow:
1. The download and formatting of AVISO NetCDF data files. This step is performed with bash scripts with the help of NCO toolbox.
2. The interpolation of SLA measurements using the DIVA tool and the generation of NetCDF files.
3. The computation of geostrophic velocity using the new SOCIB-CLS Mean Dynamic Topography (MDT).
4. The preparation of graphics for the region of interest. This step is performed with a script in Python using the Matplotlib plotting library.

The generated maps were used in the frame of G-ALTIKA (see poster by Pascual et al.) experiments carried out in the southwest of Ibiza island in August 2013. The results for this region show a good agreement with AVISO near-real time products for the Mediterranean Sea, while some differences are observed in the representation of eddies and meanders.

HF Radar data partially covering G-ALTIKA domain as well as drifter are used for further validation and comparisons.
OSTS session
Near Real Time Products and Applications and Multi-Mission, Multi-Sensor Observations
Download to PDF