Geophysical Research Abstracts
Vol. 15, EGU2013-10218-2, 2013
EGU General Assembly 2013

Assimilation of drifters' trajectories in velocity fields from coastal radar and model via the Lagrangian assimilation algorithm LAVA.

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The Lagrangian assimilation algorithm LAVA (LAgrangian Variational Analysis) is customized for coastal areas in the framework of the TOSCA (Tracking Oil Spills & Coastal Awareness network) Project, to improve the response to maritime accidents in the Mediterranean Sea.

LAVA assimilates drifters' trajectories in the velocity fields which may come from either coastal radars or numerical models. In the present study, LAVA is applied to the coastal area in front of Toulon (France). Surface currents are available from a WERA radar network (2km spatial resolution, every 20 minutes) and from the GLAZUR model (1/64° spatial resolution, every hour). The cluster of drifters considered is constituted by 7 buoys, transmitting every 15 minutes for a period of 5 days.

Three assimilation cases are considered: i) correction of the radar velocity field, ii) correction of the model velocity field and iii) reconstruction of the velocity field from drifters only.

It is found that drifters' trajectories compare well with the ones obtained by the radar and the correction to radar velocity field is therefore minimal. Contrarily, observed and numerical trajectories separate rapidly and the correction to the model velocity field is substantial. For the reconstruction from drifters only, the velocity fields obtained are similar to the radar ones, but limited to the neighbor of the drifter paths.