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A new synergetic approach for the determination of the sea-surface currents in the Mediterranean Sea

Daniele Ciani (1,2), Marie-Hélène Rio (2), and Rosalia Santoleri (1)

(1) Consiglio Nazionale Delle Ricerche, Istituto di Scienze dell'Atmosfera e del Clima, Rome, Italy (daniele.ciani@artov.isac.cnr.it), (2) Collecte Localisation Satellites, Ramonville Saint-Agne (Toulouse), France

We present a new method for the remote retrieval of the sea-surface currents in the Mediterranean Sea.
Combining observations from multiple satellite sensors, we created daily L4 high-resolution maps of sea-surface currents, merging sea-surface height (SSH) and temperature (SST) data. The quality of the new multi-sensor currents has been assessed through comparisons to other surface-currents estimates, as the ones obtained from ships Automatic Identification System (AIS), HF-Radar-derived currents in the Malta-Sicily Channel and ocean numerical model outputs. The study evidenced that our synergetic approach can improve the present-day diagnostics on the surface-currents in the Sicily Channel area. Indeed, assuming HF-Radar estimations as a reference, the merged SSH/SST currents exhibit smaller RMS errors than altimetric data, mainly due to their enhanced spatial and temporal resolution and to their capability of reproducing ageostrophic phenomena (like e.g. upwelling). The improvements are also found with respect to the model-derived currents. Moreover, the results of the comparative study proved to be very satisfactory using the AIS-derived data.
The main perspective of this work, focused on the Mediterranean area, is the construction of hourly high-resolution currents which could be validated using both HF-Radar multiple platforms and in-situ measured hourly data.