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The Mediterranean Forecasting System: recent developments

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Recent developments of the Mediterranean Monitoring and Forecasting Centre of the EU-Copernicus marine service, the Mediterranean Forecasting System (MFS), are presented. MFS provides forecast, analysis and reanalysis for the physical and biogeochemical parameters of the Mediterranean Sea. The different components of the system are continuously updated in order to provide to the users the best available product. This work is focus on the physical component of the system.
The physical core of MFS is composed by an ocean general circulation model (NEMO) coupled with a spectral wave model (Wave Watch-III). The NEMO model provides to WW-III surface currents and SST fields, while WW-III returns back to NEMO the neutral component of the surface drag coefficient. Satellite Sea Level Anomaly observations and in-situ T & S vertical profiles are assimilated into this system using a variational assimilation scheme based on 3DVAR (Dobricic, 2008) .
Sensitive experiments have been performed in order to assess the impact of the assimilation of the latest available SLA missions, Altika and Cryosat together with the long term available mission of Jason2. The results show a significant improvement of the MFS skill due to the multi-mission along track assimilation.
The primitive equations module has been recently upgraded with the introduction of the atmospheric pressure term and a new, explicit, numerical scheme has been adopted to solve the barotropic component of the equations of motion.
The SLA satellite observations for data assimilation have been consequently modified in order to account for the new atmospheric pressure term introduced in the equations. This new system has been evaluated using tide gauge coastal buoys and the satellite along track data. The quality of the SSH has improved significantly while a minor impact has been observed on the other state variables (temperature, salinity and currents).
Experiments with a higher resolution NWP (numerical weather prediction) forcing provided by the COSMO-MED system (provided by the Italian Meteorological Office), have been performed and a pre-operational 3-day forecast production system has been developed.
The comparison between this system and the official one forced by the ECMWF NWP data will be discussed.