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Exploring a new Lagrangian based Short Term Prediction methodology for HF Radar currents

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The use of HF Radar data is increasing worldwide for operational oceanography, as it provides real-time coastal surface currents at high temporal and spatial resolution. For operational purposes, gap-filled fields are needed for Lagrangian applications as well as to forecast the trajectories for real applications. In this work, an empirical real-time Short-Term Prediction (STP) system is presented in order to provide short term forecast (up to 48 hours) of ocean currents from HF-Radar.
The developed method is based on analogues of past fields. The system computes the trajectories of particles in the domain covered by the HF radar using the last 48 hours and it then searches for similar patterns in a pre-run data set of trajectories computed from a gap-filled set of OMA fields. Once the "most similar" pattern is found -in terms of Lagrangian distances- the following 48 hours corresponding to the analogue are used to provide the forecast.
To estimate the quality and liability of the forecast fields, an error-file is generated for each forecast. It includes the values of the minimum separation distance errors found between the target 48h period and the corresponding analogues and the spread of the forecast 48h periods obtained for the different analogues, among others.
The method is applied to four years of hourly HF-Radar data and results show that the STP-system improves the persistence after 6 hours. Besides, this Lagrangian approach improves previous prediction systems implemented in the same area.