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# Skill assessment of gap filling methodologies for HF-radar currents.

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Operational oceanography (OO) for coastal applications demands a set of surface data in (near)real time. Continuous advances in ocean observing technologies provide new insights in understanding coastal ocean processes. In particular, HF radar is an emerging cost-effective monitoring system that provides high-resolution surface currents over relatively large coastal areas that allows the study of transport and dispersion of surface tracers (e.g. fish larvae, pollutants, floating marine litter).

One of the main objective in coastal OO, is the computation of Lagrangian descriptors such as the Lagrangian Coherent Structures, the determination of the residence time, the study of dispersion and mixing scales, with direct applications in search and rescue operations (SAR), oil spill management, and a large etcetera. In all cases the complete spatial and temporal velocity data is required to compute (forward or backwards in time) the trajectories of virtual particles in the flow. However failures in hardware and software can compromise the availability of data, resulting in incomplete spatial and temporal fields.

Several methods (Open-boundary Modal Analysis -OMA-; Data Interpolating Empirical Orthogonal Functions -DINEOF-, Self Organized Maps -SOM-, etc.) have been proposed to fill spatio-temporal gaps in geophysical time series. In this work we apply those techniques to fill HF-Radar data and then with a systematic experiment we quantify the error introduced by each method in the Eulerian and Lagrangian frames.