

EGU21-15588

<https://doi.org/10.5194/egusphere-egu21-15588>

EGU General Assembly 2021

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Comparing High Frequency Radar radial and total derived observations capability to correct surface currents using Data Assimilation

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High Frequency Radars (HFR) are a mature remote sensing technology which is widely used in ocean observing systems to monitor surface currents in coastal areas. HFR systems are composed of 2 or more antennas which measure water motion speed along certain bearings, providing radial observations, which are later on postprocessed and mapped to generate orthogonal currents observations (u , v), herein named Totals.

Both Radial and Total observations have been used to correct surface currents through data assimilation in numerous works in the past years, but, in our opinion, there is a lack of studies comparing the performance of both types of data. Here we present a series of experiments evaluating the capabilities of HFR to correct surface currents in the Ibiza Channel using data assimilation. We put special interest in assessing the potentialities of whether using radial or total observations and also their capabilities in a real operational context.

A Lagrangian assessment using a set of 14 surface drifters deployed in the area allows to evaluate the performance of both kinds of observations, showing how the separation distance between drifting buoys and virtual particles is reduced in both cases.