Geophysical Research Abstracts
Vol. 12, EGU2010-9349, 2010
EGU General Assembly 2010

Surface circulation in the Iroise Sea (western Brittany) derived from high resolution current mapping by HF radars

Alexei Sentchev (1), Philippe Forget (2), Yves Barbin (2), Louis Marié (3), and Fabrice Ardhuin (4)

(1) Laboratoire d'Océanologie et Géosciences (CNRS-UMR8187), Université du Littoral - Côte d'Opale, 62930 Wimereux, France (alexei.sentchev@univ-littoral.fr), (2) Laboratoire de Sondages Electromagnetiques de l'Environnement Terrestre (CNRS-UMR6017), Université du Sud Toulon Var, 83130 La Garde, France (philippe.forget@lseet.univ-tln.fr yves.barbin@lseet.univ-tln.fr), (3) Laboratoire de Physique des Océans, Ifremer / Centre de Brest, BP 70, 29280 Plouzané, France (louis.marie@ifremer.fr), (4) Laboratoire d'Océanographie Spatiale, Ifremer / Centre de Brest, BP 70, 29280 Plouzané, France (fabrice.ardhuin@ifremer.fr)

The use of high frequency radar (HFR) systems for near-real-time coastal ocean monitoring necessities that short time scale motions of the radar-derived velocities are better understood. While the ocean radar systems are able to describe coastal flow patterns with unprecedented details, the data they produce are often too sparse or gappy for applications such as the identification of coherent structures and fronts or understanding transport and mixing processes.

In this study, we address two challenges. First, we report results from the HF radar system (WERA) which is routinely operating since 2006 on the western Brittany coast to monitor surface circulation in the Iroise Sea, over an area extending up to 100 km offshore.

To obtain more reliable records of vector current fields at high space and time resolution, the Multiple Signal Classification (MUSIC) direction finding algorithm is employed in conjunction with the variational interpolation (2dVar) of radar-derived velocities. This provides surface current maps at 1 km spacing and time resolution of 20 min. Removing the influence of the sea state on radar-derived current measurements is discussed and performed on some data sequences.

Second, we examine in deep continuous 2d velocity records for a number of periods, exploring the different modes of variability of surface currents in the region. Given the extent, duration, and resolution of surface current velocity measurements, new quantitative insights from various time series and spatial analysis on higher frequency kinematics will be discussed. By better characterizing the full spectrum of flow regimes that contribute to the surface currents and their shears, a more complete picture of the circulation in the Iroise Sea can be obtained.