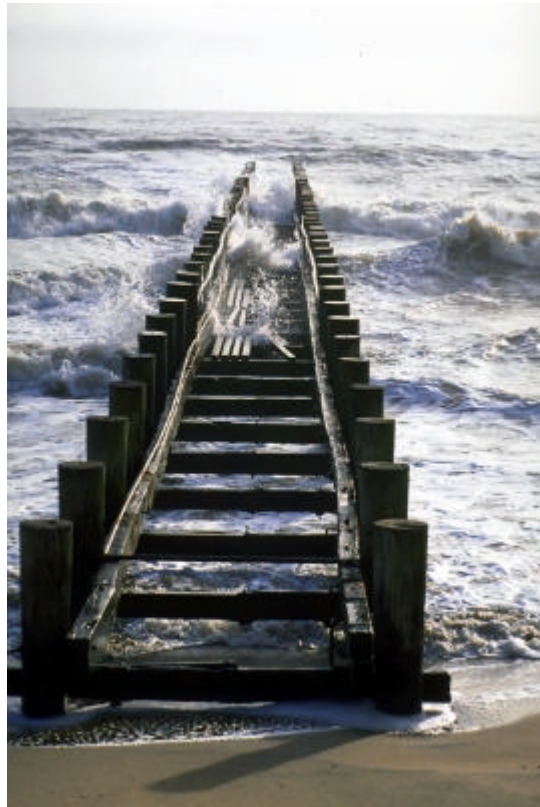


Saturn Solutions

SEA SURFACE CURRENT MONITORING RADARS



Introduction

The littoral zone is an area of economic and environmental importance. It is also one in which all oceanographic parameters can vary quite dramatically in short time and space scales. Similarly it presents problems for long term autonomous



moorings of instrument packages due to high volumes of shipping, fishing and

leisure craft. Surface current monitoring Radar systems have proven to be an essential tool in monitoring coastal flows around the world.

These systems are deployed from on-shore stations. They provide high spatial resolution data (100-1000m) over long stretches of coastal waters and at typical repeat cycles of 20 minutes. The speed



and direction of currents from the integrated surface are determined through the use of high frequency radio waves. At an operational frequency of 27MHz, a working range of 35km is achieved. This provides a cell resolution of 1km and up to 700 data points every 20 minutes. In order to produce orthogonal u,v components of velocity, two

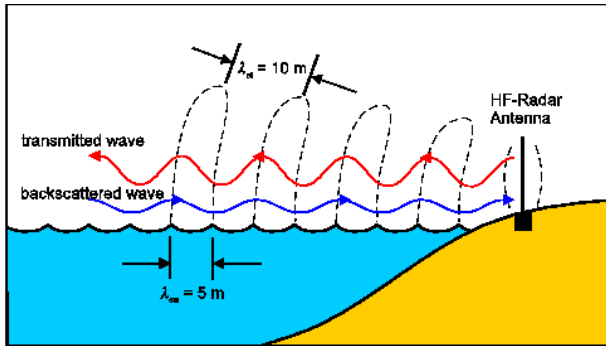
systems are required.

These would be at two distinct locations

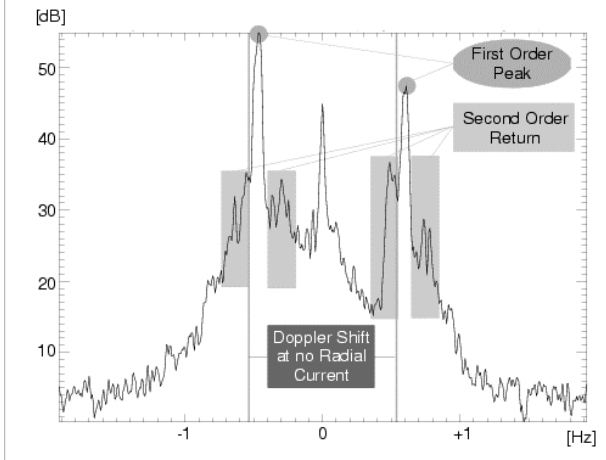


illuminating the same sea area. Surface current Radar systems will operate in all but the most extreme sea states and require minimal supervision. They provide a cost effective way of collecting large volumes of spatially and temporally rich data in the littoral zone, and have proven to be accurate. The nature of data collected by Surface Current Radar systems makes them ideal for use in validating circulation models or for providing initial conditions for such models.

The Principle

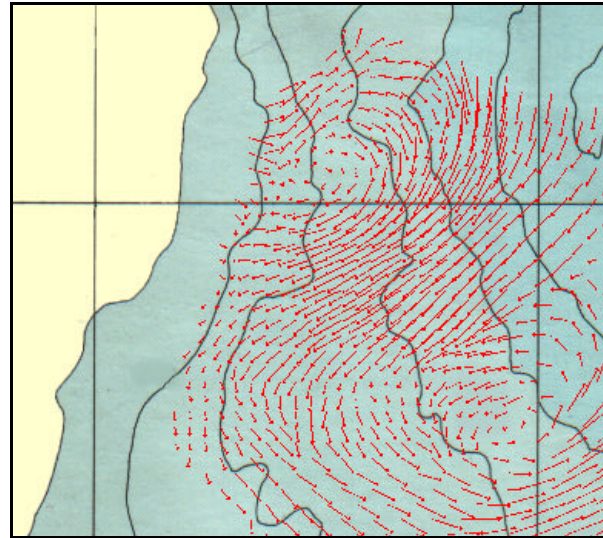


Surface current Radar operates by measuring the speed of sea waves of a particular length which includes any motion due to current. The radio wave interacts with sea waves of precisely half its wavelength. During normal operations it will detect both the advancing and receding waves which appear as Bragg peaks on the power spectrum of the reflected signal. As the natural speed due



to gravity of a sea wave is known, the difference between the theoretical position of the Bragg peak (in zero current conditions) and its actual position can be

used as a measure of the speed of the current. In practice measurements obtained from a single radar only give the component of the motion which is either directly towards or away from the site. Values from two sites are needed to calculate both the speed and direction of the current at a point. This data is mapped out by the system on a grid.



Southampton

Telephone: +44 (0)23 8022 7322
Fax: +44 (0)23 8022 7319

Folkestone

Telephone: +44 (0)1303 248634
Fax: +44 (0)1303 220315

Email: sales@saturnsolutions.co.uk
www.saturnsolutions.co.uk