



## **Sea surface waves and currents from C-band microwave radar**

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The MIROS (Microwave Radar Observing System) wave and current radar was developed in the early 80's and was operational from 1984. The system was developed to measure directional wave data using the Doppler shift, and surface currents using the dual frequency technique. The radar operates in C-band (5.8GHz). The Miros Wave Radar is placed on several fixed and floating platforms in the North Sea, off shore Canada, Brazil and Korea. After several validations the system has been approved as standard wave monitoring tool for offshore operations and is used for input to the long-term wave databases for the Norwegian continental shelf and adjacent areas.

The directional wave spectra are measured in a pulse Doppler mode where linear wave theory is used to transform the deduced velocity spectrum into a directional wave height spectrum. The wave measurements have been validated by several comparisons with directional wave buoys and by using in-situ wind measurements. Continuous time series of wave data and wave spectra are available from locations on the Norwegian Continental Shelf, some as long as 20 years.

The surface current is found by measuring the speed of 15 metres long gravity waves using the dual frequency technique. The difference between the measured particle velocities in 6 different directions on the sea surface and the velocity given by the dispersion relationship is used to calculate the current vector. Initially the quality of the real-time current data was low and post-processing was needed before the data could be used. Recently a new algorithm for surface current measurements has been implemented which significantly improved the quality and capture rates of real-time data. The new algorithm has been in operation from the autumn 2005. The current estimates have been compared to wind data after the tidal contribution is removed and a harmonic analysis has been performed.