

Atmospheric and Oceanic Vortex Streets: Observations by Satellite Radars

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Abstract

The surface imprints of atmospheric and oceanic vortex streets in the vicinity of islands of the northwestern Pacific Ocean were found in fields of sea surface roughness on radar images. The images were obtained by an X-band side-looking real aperture radar (RAR) from the Okean series satellites and an S-band synthetic aperture radar (SAR) from ERS-1/2. The broad swath width (460 km) and a spatial resolution of 1-2 km of the RAR allow estimation of the characteristic parameters of atmospheric vortices and vortex street evolution downstream. A comparison of visible/IR images with radar images has shown that sharp gradients of surface winds were observed near boundaries of cloud vortices. The detailed structure of the oceanic vortices and vortex streets formed by the Kuroshio east of Taiwan and tidal currents west of Taiwan was revealed with ERS SAR images.