

Oceanic Phenomena Northeast of Taiwan From Almaz SAR Image

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(Manuscript received 23 February 1994, in final form 28 August 1994)

ABSTRACT

The first analysis of a Synthetic Aperture Radar (SAR) image over Taiwan area is presented. This image was obtained from the Russian Almaz satellite of pass 7519. The brightness of the SAR images represents the backscattering cross section of the sea surface or the roughness of the sea surface that responds dynamically to the surface wind, the surfactant concentration and the divergence of surface current. Because SAR uses microwave as a working frequency, it can provide an un-fragmented image of the sea surface with the least interference from the cloud or weather system. In this study, weather maps, wave analysis maps, ship data, satellite thermal images and bathymetric charts were used to interpret the brightness variations of the SAR image northeast of Taiwan, and a wealth of oceanic features – slicks, surface waves, packets of internal waves, current, bottom topography, vortices, ships and ship wakes were found. These features should be further validated with shipborne measurements, satellite IR data, and SAR images from other satellites, like the first European Space Agency remote sensing satellite, the ERS-1.

(Key words: SAR, Taiwan, Oceanography, Almaz)

1. INTRODUCTION

The region northeast of Taiwan is a region of special interest to local oceanographers. Oceanographic research projects in Taiwan have concentrated on Kuroshio-related studies since 1989, such as the Kuroshio Edge Exchange Processes (KEEP) and the World Ocean Circulation Experiment. Such efforts resulted in a better understanding of the interaction between the Kuroshio and the East China Sea water. The hydrophysical characteristics and space-time variability of the upwelling northeast of Taiwan and the Kuroshio were investigated by contact methods during sea expeditions (Liu *et al.*, 1992b), by analysis of NOAA

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