EFFECTS OF AIR/SEA CONDITIONS ON AZIMUTH MODULATIONS IN Ku-BAND OCEAN RADAR BACK SCATTER

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The objective is to improve the understanding; of the relationship of ocean backscatter versus near surface winds and to enhance scatterometry techniques for microwave remote sensing of ocean winds. Algorithms for wind-vector retrieval using scatter ometer data depend on azimuth modulations of backscat ters. Azimuth signatures of ocean surfaces arc thus important to the accuracy of wind vect or measurements. A more extensive data set, covering atmospheric and oceanic conditions that will allow detailed study of azimuth modulations in ocean radar backscatter, is necessary. During the Surface Wave Dynamics Experiment (SWADE) carried out in 1 991, the Jet Propulsion Laboratory Scat terometer NU SCAT operating at Ku band was successfully used to acquire ocean backscatter data over a wide variety of oceanic and atmospheric conditions. These conditions include low to moderate wind, low to high significant wave height, and large differences in sea surface temperature across the Gulf stream boundary. Ten flights of data collection were conducted on the NASA Ames C130 aircraft during SWADE, which resulted in 30 hours of data. The experimental area was deployed with several buoys which provided appropriate in-situ data to correlate with the radar backscatter. Furthermore, other aircraft, and ship were used to collect directional wave spectra, and frictional velocity. We use the entire NUSCAT/SWADE data base in conjunction with buoy, aircraft, and ship data to investigat e backscatt er azimuth modulations and compare the observed results under various physical conditions to predictions from geophysical model functions such as SASS, which is based on neutral winds.