

Abstract. submission for SD98 (William I,. Barnes)

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Conference Title: Earth Observing Systems III (sd03)
Conference Chair-: William I,. Barnes

Title: Calibration of the NASA Scatterometer using a ground calibration station

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Oral presentation preferred

Abstract:

The NASA Scatterometer (NSCAT) operated from August 1996 through June 1997 on the Japanese Advanced Earth Observation Satellite (ADEOS) .

The primary mission of NSCAT was to measure ocean surface vector winds by accurately measuring the backscattering cross-section at Ku band. The backscattering cross-section is related to the wind induced surface roughness . NSCAT is also providing useful data over land and ice with many important applications in remote sensing.

To aid in calibrating and monitoring the performance of NSCAT, a calibration ground station (CGS) was operated in White Sands, New Mexico from mid November 1996 through February 1997. The CGS was used to verify the proper operation of the NSCAT system including transmit power, frequency, pulse width, and receiver gain. It was also used to track spacecraft attitude variation, and to measure the antenna gain balance between different beams. This presentation will describe the design and operation of the CGS, and the principle results obtained during the calibration period. The CGS is a transmit/receive system which was used to record pulses from NSCAT, and to transmit pulses back to NSCAT. The CGS data was synchronized with NSCAT telemetry, and processed for timing, frequency, and gain information. These results were then compared with the values expected using the nominal pre-launch calibration data. Timing discrepancies indicated significant spacecraft attitude variations beyond the values reported in telemetry. Gain discrepancies showed a small ascending/descending difference. The cause of this difference (NSCAT or the CGS) is not clear at this time.

Keywords: NSCAT, scatterometer, radar, calibration

Biography:

Richard West completed the B.S.E.E. (198'7), M.S.E.E. (1990), and Ph.D. degree in Electrical Engineering (1994) all at the University of Washington. His graduate work specialized in electromagnetic scattering theory with applications to microwave remote sensing. In 1995, he began working at the Jet Propulsion Laboratory in the Radar Science and Engineering section. His work at JPL covers scatterometer and radiometer system design and performance evaluation. His research interests include microwave remote sensing, scattering theory, and inverse theory.