Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
30 SEP 1997		**00-00-1997 to 00-00-1997**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Variation of Short-scale Waves in the Shoaling Zone	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **National Aeronautics and Space Administration (NASA),Goddard Space Flight Center,Laboratory for Hydrospheric Processes,Wallops Island,VA,23337**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**2**	

VARIATION OF SHORT-SCALE WAVES IN THE SHOALING ZONE

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LONG -TERM GOAL

Goals are to provide measurements of short-scale sea surface roughness in the shoaling wave zone, determine the correlation between this short-scale slope variance and surface wind stress, and finally suggest the ramifications to microwave remote sensing in the shoaling zone.

SCIENTIFIC OBJECTIVES

Primary objective is to determine the characteristics of near-vertical incidence millimeter-wave radar backscatter in the surf zone and out to sea. This information relates directly to an integration of the sea surface spectrum over wave scales from 1 m down to 1 cm. The short-scale waves are known to be well-coupled to the wind stress. Technical objective will be to obtain collocated wind stress, long wave, and absolutely calibrated near-vertical radar scattering data together over the shoaling zone.

APPROACH

Plan is to design, fabricate and fly a simple down-looking scatterometer (DLS) on the NOAA LongEZ as a team member in J. Sun's project entitled 'Spatial Variation of the wave, stress, and wind fields in the shoaling zone'. Aircraft size dictates that the radar frequency be quite high, a 36 GHZ (Ka-band) transmit frequency has been chosen. The radar will be a simple CW scatterometer making an absolute power measurement. This data will be related to the small-scale surface slope using known ocean models already developed. The radar will be built and flown in calendar 1997. We plan to participate in the first LongEZ pilot experiment of Nov. 1997.

WORK COMPLETED

As of Oct. 1997, the radar has been designed, built, installed on the LongEZ and flight tested. A report is provided at the web site: http://osb1.wff.nasa.gov/rows/rockwd.html. Necessary post flight modifications have been made in anticipation of the Nov. 1997 pilot experiment.

RESULTS

Project is just starting up so there are no results at this time.

IMPACT

We expect the impact of these results to come in an improved understanding of how to better use microwave remote sensing in the shoaling zone.

TRANSITIONS

N/A

RELATED PROJECTS

As mentioned above, this work is directly related to the NOAA LongEZ shoaling zone activities headed by J. Sun. This work is also closely related to NASA Mission to Planet Earth research related to the improved estimation of ocean sea level and wind speed as extracted from satellite altimeter and scatterometer data.

REFERENCES

First test flight results at : http://osb1.wff.nasa.gov/rows/rockwd.html