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Dr. Allen H. Watkins
United States Department of the Interior
Geological Survey
EROS Data Center
Sioux Falls, South Dakota 57198

Dear Dr. Watkins:

Enclosed is the abstract for my Pecora Symposium paper. Thank you for the invitation and I will be glad to participate in the Symposium.

Sincerely yours,

Charles Elachi, Ph.D.

CE:ot
Enclosure

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PECORA VIII (October 4-7, 1983)

Shuttle Imaging Radar Research Facility

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Abstract

The Seasat Imaging Radar (1978) and the Shuttle Imaging Radar SIR-A (1981) experiments have successfully demonstrated that spaceborne synthetic aperture imaging radars provide important geophysical information about the Earth's surface, its cover and, in some cases, the near subsurface. Radar images are being used to study geologic structures, detect and map morphologic features covered by thin layers of sand or alluvim, delineate the extent of clear cutting in tropical regions, detect changes in soils moisture, monitor the motion of polar ice floes and map ocean wave patterns:

The Seasat and SIR-A sensors provided information about the surface using a very limited set of observational parameters. Both systems operated at a wavelength of 25 cm, with an HH polarization and at fixed incidence angles (20° for Seasat, 50° for SIR-A). However, multiparameter observations are required in order to extract more quantitative information about the surface roughness, morphology and cover. This is the basis for a multiyear NASA program which consists of an evolutionary Shuttle Imaging Radar Research Facility that will allow Earth imaging with a progressively expanded multiparameter capability. The first step will be implemented in 1984 as the SIR-B. The SIR-B will be able to view the surface at multiple

incidence angle. This will be followed by SIR-C in 1987 with capability of imagery at multiple polarization and dual frequency. By the end of the decade the SIR-D will have the additional capability of many frequencies.

The research planned with this research facility, in combination with the research conducted in visible and IR spaceborne remote sensing will lead to a full capability of observing the Earth surface across most of the electromagnetic spectrum.