

Land and Ocean Remote Sensing Using Signals of Opportunity Reflectometry

Dr. Rashmi Shah

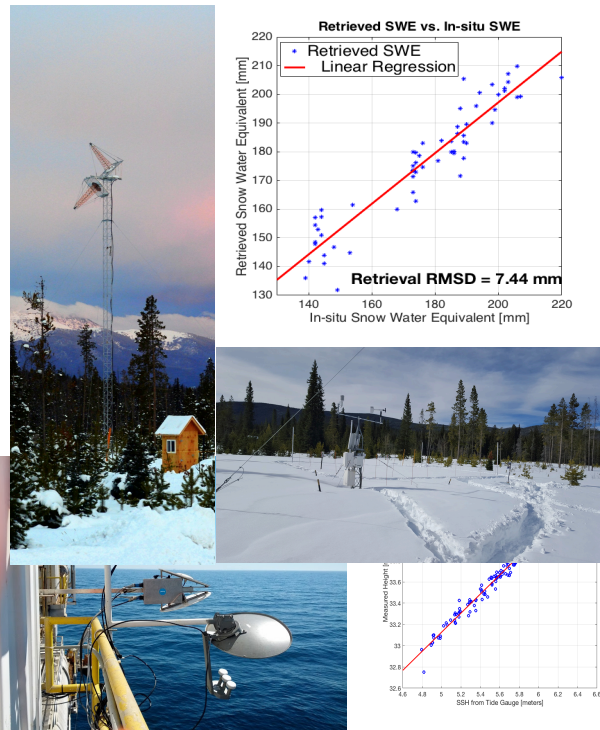
Near Earth Tracking Applications

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

Abstract:

Reflectometry is a new approach to microwave remote sensing that utilizes signals of opportunity (SoOp). In this technique, the powerful active navigation and/or digital communication transmitters are re-utilized as illuminators in a bistatic radar configuration. This technique represents similar features of both active radar and passive radiometry, while showing some promise in circumventing some problems in each of those two techniques. The use of existing sources means that the reflectometry instruments are smaller and consume order of magnitude lower power than radars. At the same time, the surface resolution is determined by either the transmitter bandwidth or the transmitting frequency and not the antenna size as in radiometry. Furthermore, measurements can be made in any band presently occupied by a transmitter and are not limited only to the spectrum allocated for scientific applications.

This presentation will primarily cover current ongoing SoOp projects at JPL. The first one is to use P-band signal for measurement of snow properties (snow water equivalent and snow depth) and soil properties (root zone soil moisture). An overview of SNOOPI mission will also be provided. And the second one is to use Ku/Ka wideband (>400 MHz) signal to measure ocean properties (sea surface height).



Biography:

Rashmi Shah is a research technologist in the Tracking Systems and Applications Sections. She received B.S. in Electrical Engineering in 2007 from Rochester Institute of Technology. She then got her M.S. and Ph.D. in Aeronautical and Astronautical Engineering from Purdue University in 2010 and 2014 respectively. She joined JPL in 2014. Her background and interests are microwave remote sensing, electromagnetic scattering, remote sensing using signals of opportunity reflectometry. She is the current JPL lead for NASA InVest Mission: SNOOPI. She is also part of the core team member for JPL Foundry's A-team. She is a senior member of Institute of Electrical and Electronics Engineers (IEEE). She serves as a co-chair of *GNSS and Signals of Opportunity Working Group* for the *IEEE Geoscience and Remote Sensing Society's Instrumentation and Future Technologies Technical Committee*. She also serves as a chapter chair for IEEE Metropolitan Los Angeles GRSS Chapter.

