

Fall 2011 Colloquium Series

Soil Moisture Remote Sensing with Signals of Opportunity

Dr. Stephen Katzberg
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4:30 P.M.
ARMS B071

Abstract

Soil Moisture is an important environmental parameter for understanding the water cycle and climate. Satellite remote sensing is necessary to obtain regular global measurements of this quantity. In 2009 the SMOS satellite was launched by ESA and SMAP is under development by NASA (2014 planned launch) to remotely sense soil moisture. SMOS and SMAP will use passive microwave radiometers, operating at L-band, to sense soil moisture. This technique is limited due to the large aperture size and shallow penetration depth in the soil (a few cm). Dr. Stephen J. Katzberg will describe a new method for remote sensing of soil moisture, using of Signals of Opportunity. Signals of Opportunity are satellite microwave transmitters such as GPS, Direct Broadcast Satellites (DBS), XM/Sirius Radio, among others. These sources of radiation are ubiquitous and represent relatively powerful signals primarily distributed over land masses. Dr. Katzberg will discuss how this approach is related to traditional methods of soil moisture remote sensing, discuss the unifying principles, and show why the new approach has benefits to several classes of users. Examples from the SMEX 2002 field experiment as well as recent data developed at Clemson University will be presented.

Bio

Steve Katzberg was born in Clinton, SC in 1943, received his BS from MIT in 1965, and his MS and PhD from University of Virginia in 1967 and 1970 respectively. He worked nearly exclusively at NASA Langley Research Center for 40 some-odd years (one year in at Johnson Space Center) and is now retired and a Distinguished Research Associate at Langley and an Adjunct Professor at South Carolina State University. Dr. Katzberg has worked on a variety of NASA activities including the Viking Mars Project (Lander Cameras), Laser Heterodyne Spectrometer, remote sensing systems analysis, Space Station automation and robotics, among others. Since 1994, Steve has moved to full-time exploitation of GPS reflection research, including soil moisture, snow, ice, and ocean surface winds. The latter, spanning ten years has involved flying GPS receivers on the NOAA research Hurricane Hunters from MacDill AFB, Florida. Steve currently makes his home in Orangeburg, South Carolina with his wife and their three dogs.

An informal coffee & cookie reception will be held prior to the lecture at 4:00 p.m. in the AAE/ARMS undergraduate lounge (directly in front of ARMS 3rd floor elevators).
