

Microwave Remote Sensing

Microwave remote sensing uses active and passive microwave systems to observe the ocean, atmosphere, terrain, and other environments. Data from these sensors are critical for Earth science, land use monitoring, and global climate studies. The [ESL](#) microwave remote sensing group continues to lead technology development and theoretical studies of remote sensing systems. A sample of recent projects includes:

Development of Interference Suppression Technology for Microwave Radiometers

A prototype radiometer based on a digital receiver back end has been developed and is currently being used in L-band experiments at ESL. The system has also been deployed in both the Soil Moisture Experiment (SMEX) and the AMSR-E Antarctic Sea Ice campaign (AASI) on-board the Navy's P-3 aircraft in 2004. Recent results confirm the abilities of our systems for detecting and mitigating interference. These technologies are currently under consideration for inclusion on future U.S. weather satellites.

Model Development for Remote Sensing Systems

The remote sensing group is also assisting with model development for the WindSAT radiometer of the Naval Research Laboratory (launched January 2003.) Electromagnetic methods for scattering and emission from a rough surface have been combined with hydrodynamic methods for describing the sea surface to produce an efficient model for WindSAT measured data. This model has been applied to retrieve global sea surface wind vectors from WindSAT measurements.

Theory of Rough Surface Scattering

The remote sensing group continues to be a world leader in the development and assessment of both numerical and analytical theories of scattering from rough surfaces. Recent work has focused on implementation and assessment of the "local curvature" and "weighted curvature" approximations (LCA/WCA), as well as other new theories of surface scattering.

