

A Large Aperture 650 GHz Near-Field Measurement System for the Earth Observing System Microwave Limb Sounder

Dan Slater, Nearfield Systems Inc., Carson, CA

Paul Stek⁺, Rick Cofield⁺, Robert Dengler⁺, Jack Hardy⁺, Robert Jarnot⁺, Ray Swindlehurst Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

This paper describes a large aperture, 650 GHz, planar, near-field measurement system developed for Field of View characterization of the Earth Observing System Microwave Limb Sounder (EOS MLS). Scheduled for launch in 2003 on the NASA EOS Aura spacecraft, EOS MLS is being developed by the Jet Propulsion Lab to study stratospheric chemistry using radiometers from 118 to 2500 GHz. The combination of a very high operating frequency and a 1.6-meter aperture, coupled with significant cost and weight restrictions, required a new look at near-field scanner design approaches. Nearfield Systems Inc. (NSI) developed a planar scanner that provides a planar accuracy of 4 microns RMS over the entire 2.4 x 2.4 meter scan area. This paper presents an overview of this system including the sub-millimeter wave RF subsystem and the ultrahigh precision scanner. Representative measurement results will be shown.

Keywords: Near-Field, Antenna, JPL, Microwave Limb Sounder, MLS, EOS, Microwave Interferometry, THz, Sub-millimeter