Diagnostics of the SMOS radiometer antenna system at the DTU-ESA spherical near-field antenna test facility

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The recently developed Spherical Wave Expansion-to-Plane Wave Expansion (SWE-to-PWE) antenna diagnostics technique is employed in an investigation of the antenna system in the Microwave Imaging Radiometer using Aperture Synthesis (MIRAS) for ESA’s Soil Moisture and Ocean Salinity (SMOS) mission. The SWE-to-PWE antenna diagnostics technique successfully identifies the sources of the anomalies detected in 2 of the 138 MIRAS antenna farfield patterns that were measured during the on-ground calibration at the DTU-ESA Spherical Near-Field Antenna Test Facility in 2006. In addition to its obvious value for the SMOS mission, this investigation also provides an experimental validation of the SWE-to-PWE antenna diagnostics technique.

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