Announcing the Final Examination of Catherine May for the degree of Master of Science

Time & Location: March 20, 2012 at 3:00 PM in HEC 450
Title: Engineering Evaluation of Multi-beam Satellite Antenna Boresight Pointing using Land/Water Crossings

This thesis concerns satellite microwave remote sensing research conducted at the Central Florida Remote Sensing Laboratory under grant to the NASA Headquarters Earth Science Program. Specifically, this thesis is an on-orbit engineering evaluation of the calculated earth geolocations of the antenna footprints for the Microwave Radiometer on the Aquarius/SAC-D satellite.

MWR measures the microwave blackbody emission (brightness temperature, Tb) from the earth’s surface. At microwave frequencies, land appears radiometrically ‘hot’ while ocean appears ‘cold’; therefore, coastlines can be easily determined from global images of the MWR Tb. A geolocation assessment algorithm was developed to determine the MWR observed land/water boundaries. The theoretical basis of this algorithm is presented and on-orbit measurement results are compared with high-resolution coastline maps. Further analysis of land/water crossing data for ascending/descending orbits and forward/aft viewing antenna beams will be described to show that spacecraft roll, pitch, and yaw attitude errors may be estimated from comparisons with coastline maps.

Major: Electrical Engineering

Educational Career:
Bachelor's of Mathematics, Meteorolgy, BS, 2010, University of Nebraska - Lincoln

Committee in Charge:
Dr. W. Linwood Jones, Chair, ECE
Dr. Wasfy Mikhael, ECE
Dr. Parveen Wahid, ECE

Approved for distribution by Dr. W. Linwood Jones, Committee Chair, on March 2, 2012.

The public is welcome to attend.