Announcing the Final Examination of Yazan Hejazin for the degree of Doctor of Philosophy

Time & Location: March 27, 2015 at 11:00 AM in Harris Engineering Center 356
Title: A Roughness Correction for Aquarius Using the CONAE MicroWave Radiometer

Aquarius/SACâ€“D is a joint NASA/CONAE (Argentine Space Agency) Earth Sciences satellite mission to measure global sea surface salinity (SSS), using an L-band radiometer that measures ocean brightness temperature (Tb). The application of L-band radiometry to retrieve SSS is a difficult task, and therefore, precise Tb corrections are necessary to obtain accurate measurements. One of the major error sources is the effect of ocean roughness that â€œwarmsâ€ the ocean Tb. The Aquarius (AQ) instrument (L-band radiometer.scatterometer) baseline approach uses the radar scatterometer to provide this ocean roughness correction, through the correlation of radar backscatter with the excess ocean emissivity. In contrast, this dissertation develops an ocean roughness correction for AQ measurements using the MicroWave Radiometer (MWR) instrument Tb measurements at Ka-band to remove the errors that are caused by ocean wind speed and direction. The new model was tuned using one year (2012) of on-orbit combined data from the MWR and the AQ instruments that are collocated in space and time. The roughness correction in this dissertation is a theoretical Radiative Transfer Model (RTM) driven by numerical weather forecast model surface winds, combined with ancillary satellite data from WindSat and SSMIS, and environmental parameters from NCEP; and is an alternative approach to the scatterometerâ€“derived roughness correction. The theoretical basis of the algorithm is described and results are compared with the AQ baseline scatterometer method, obtaining an overall SSS retrieval accuracy of Â±0.2 psu (practical salinity unit).

Major: Electrical Engineering

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Bachelor's of Telecommunication Engineering, BS, 2010, Princess Sumaya University for Technology
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Approved for distribution by W. Linwood Jones, Committee Chair, on March 27, 2015.

The public is welcome to attend.