Università Tor Vergata, Roma

Ingegneria Civile e Ingegneria Informatica

GeoInformation PhD Curriculum

11th 2013 GeoInformation Seminar

DISP meeting room, Ingegneria dell'Informazione, 1 Via del Politecnico
23 May 2013, starting at 15:00

Soledad Mieza, Walter Rubén Cravero

Remote sensing applications for precision farming in Argentina using optical and polarimetric SAR data

Results and ongoing research to develop remote sensing applications for Precision Farming Systems in the Province of La Pampa, Argentina, will be presented. The Province of La Pampa is situated in the central part of Argentina, within a region also named Pampa, that is mainly devoted to extensive agriculture and cattle raising. The most important summer crops for that area are sunflower, maize, and soybean. Over the past years, Site Specific Management Systems also known as "Precision Farming", for agricultural field management taking into consideration intra-field variability, started to develop. To implement these systems it is important to characterize adequately the spatial variability within plots for which remote sensing could be a viable approach.

To this end, some applications were developed using optical data, mainly Landsat TM and ETM+ imagery provided by the Argentina Space Agency (CONAE). The results that will be presented have been developed since 2004, mainly over sunflower plots, regarding the delimitation of homogenous intra-fields areas using remote sensing data, and also further studies on the correlations between spectral data and digital elevation models, soil textural data and biophysical parameters of the crop.

In the view of the SIASGE, the Italian-Argentinean satellite system composed of the four operational X-band Italian COSMO-SkyMed satellites and two L-band Argentinean (SAOCOM) to be launched in 2015, some possible applications in agriculture using SAR data started to be evaluated. After an introduction to the SAOCOM mission, the main purpose of which will be monitoring for disasters prevention by means of SAR, some local applications being developed for agriculture and environmental protection will be presented.

Finally, we will discuss some results obtained correlating sunflower growth with polarimetric data at X-band using COSMO-SkyMed images as well as some aspects regarding modeling, and how this data are expected to be used once the whole system is fully operational.

Soledad Mieza obtained her Electrical and Mechanical Engineering degree from Universidad Nacional de La Pampa (UNL-Pam), Argentina and the M.Sc. degree in Remote Sensing and GIS from the Cranfield University in England. She is now pursuing her PhD degree at the Departamento de Física, Universidad Nacional del Sur, Argentina. Her thesis on the development of polarimetric applications for agricultural purposes using data from the SIASGE constellation, COSMO-SkyMed and SAOCOM missions is being carried out under the supervision of P. Ferrazzoli and W.R. Cravero.

Since 2000, she has been involved as a researcher and PI in several projects related to the development of applications using Remote Sensing in Argentina. Since 2005, she has been team leader of a technology transfer group, to promote the use of remote sensing for precision farming on operational basis in Argentina. She is now Professor at the Physics Department at the Facultad de Ingeniería, UNLPam, Argentina. Her main research interests are in the development of agricultural applications using remotely sensed optical and SAR data.

Walter Rubén Cravero holds the M.Sc. Degree and Ph.D. in Physics and is now an Associate Professor with the Physics Department, Universidad Nacional del Sur, Bahía Blanca, Buenos Aires, and a Researcher with CONICET, Argentina. He has been Dean of the Physics Department in the past four years. From 2000 till 2002 he has been Research Fellow with the Applied Mathematics Department of the Queens University, Belfast, NI, United Kingdom.

His main research interests include atomic collision processes at intermediate and high energies, scattering theory, interaction of ionizing and non-ionizing radiation with matter and biological systems, and polarimetric SAR and optical images for Precision Agriculture. He has published several tens of papers on international journals, including Physical Review, J. of Physics, J. of Modern Optics and Bioelectromagnetics.

You are cordially invited to attend.