

Pre-Symposium Tutorial on “PolSAR and PolInSAR Data Processing and Applications”

December 5, 2016

Abstract

In the field of Satellite Remote Sensing, India excels in many fields such as satellite launching, sensor designing, data acquisition & processing, and a variety of applications for assessment and monitoring of natural resources and natural hazards in the country. Microwave Radar Remote Sensing, with the advantages like ascending & descending pass imaging capability; cloud, vegetation & ground penetration capability; high sensitivity to roughness & dielectric property of the surface, has its specific domains of applications compared to optical and thermal remote sensing. Besides, in the frontier areas like polarimetric SAR (PolSAR), Interferometric SAR (InSAR), and polarimetric interferometric SAR (PolInSAR), it produces high-quality and precise information, and provides better understanding on the interaction of electromagnetic radiation with the earth surface materials. With the successful launch of the first civilian Radar Imaging Satellite (RISAT-1) on 26th April, 2012 by Indian Space Research Organization (ISRO) and the easy availability of all-weather C-band SAR images in a variety of imaging modes at affordable price, the scope of EO applications has drastically widened for the Indian Remote Sensing user community. On this backdrop, ISRO has been conducting a series of special courses on Radar Remote Sensing at various centres including IIRS Campus of Dehradun.

On the occasion of the National Symposium on “Recent Advances in Remote Sensing and GIS Recent Advances in Remote Sensing and GIS with Special Emphasis on Mountain Ecosystems” during December 7-9, 2016 at Dehradun, One Day Pre-Symposium Tutorial on PolSAR and PolInSAR Data Processing and Applications appears to be one of the most appropriate sessions. The session will cover an overview and advances in microwave radar remote sensing with emphasis on PolSAR and PolInSAR data processing techniques and various applications.

Outline of the Tutorial

Coordinator: Dr. R.S. Chatterjee

Speakers/ Resource Persons: Dr. R.S. Chatterjee (RSC), Dr. H.S. Srivastava (HSS), Dr. Hitendra Padalia (HP), Mr. Ashutosh Bhardwaj (AB), Dr. Praveen Kumar Thakur (PKT), Mr. Shashi Kumar (SK)

PolSAR and PolInSAR Data Processing and Applications

- Overview and Advances in Microwave Radar Remote Sensing
- Introduction to Interferometric SAR (InSAR) and Polarimetric SAR (PolSAR)
- Retrieval of Polarimetric Signatures of Earth & Planetary Objects, Full & Compact Polarimetric SAR Data Processing, PolSAR Decomposition, PolSAR Image Classification, PolInSAR & SAR Tomographic Data Processing
- PolSAR and PolInSAR Applications
- RISAT SAR Data Processing, Visualization and Analysis (Hands-on Practical)
- RISAT Quad-pol and Hybrid pol SAR Data Processing and Analysis (Hands-on Practical)
- InSAR and/or PolInSAR Data Processing and Analysis (Demonstration)

Organizer and Speaker(s):

	<p>Dr. R.S. Chatterjee is a Sr. Faculty of Indian Institute of Remote Sensing (IIRS), Dehradun. He has been working in Microwave Remote Sensing, Interferometric SAR and Polarimetric SAR data analysis and applications in Geosciences and Geoenvironmental studies for the last 18 years. Besides, he has developed expertise in the areas of Thermal Remote Sensing, Structural & Tectonic studies, Groundwater & Mining induced Land Subsidence Measurement & Modelling, and Remote Sensing based Planetary Exploration studies.</p>
	<p>Dr. Hari Shanker Srivastava, Sr. Faculty at IIRS, is PhD in Physics on SAR. He is with ISRO for the past 25 years. He has carried out various studies on radiometric Calibration of SAR sensors and target interaction using SAR, InSAR, PolSAR, PolInSAR, and Passive multi-parametric microwave data from a variety of sensors like GB Scatterometer, ISRO Airborne SAR, DLR-ESAR, ERS-1, tandem ERS-1/2, JERS-1, SIR-C/X-SAR, RADARSAT-1, ENVISAT-1, RADARSAT-2, RISAT-1, AMSR-E & SMOS for various applications. He has more than 100 research publications with 545 citations. He is PhD Guide at IIT Roorkee and ISM Dhanbad with 03 current PhD students.</p>
	<p>Dr. Hitendra Padalia is a Sr. Faculty of Forestry and Ecology Department at Indian Institute of Remote Sensing (IIRS), Dehradun. He possess PhD degree in forestry. His research interests include biophysical and biochemical parameter retrieval of vegetation canopies and ecological modelling. He has worked towards SAR data processing for forest disturbance and carbon stock assessment.</p>
	<p>Er. Ashutosh Bhardwaj is a Scientist/Engineer at PRSD (RSGG), IIRS. His major working experience comes from NRSC, Hyderabad and BITS, Pilani besides IIRS. He has over 16 years of experience in teaching, research and executing various projects in areas of Photogrammetry, Surveying, GNSS, Remote Sensing & SAR Interferometry. He has been involved in DGPS surveys and mapping projects for user departments, like TCPO, RUIDP, IRCON, DDA, KMC and Government of Republic of Maldives.</p>
	<p>Dr. Praveen K. Thakur is a Sr. Faculty Member of Indian Institute of Remote Sensing (IIRS), Dehradun. He has been working in SAR based inversion models, DinSAR, Altimeters and passive MW based products for analysis and applications in water resources and hydrology for the last 12 years. Besides, he has developed expertise in the areas of snow and flood hydrology, hydrological modeling, glacier and ice sheet dynamics, dynamic downscaling, data assimilation, flood early warning, groundwater modelling, and remote sensing based planetary hydrological studies.</p>
	<p>Mr. Shashi Kumar is working as Scientist/Engineer 'SD' in Photogrammetry & Remote Sensing Department of Indian Institute of Remote Sensing (IIRS), ISRO, Dehradun. His research work is focused on SAR Remote Sensing with special emphasis on Polarimetric SAR (PolSAR), Polarimetric SAR Interferometry (PolInSAR) and SAR Tomography for structural and biophysical characterization of manmade and natural features.</p>