

# URSI Commission F

## Microwave Signatures 2013

Specialist Symposium on Microwave Remote Sensing of the Earth, Oceans, and Atmosphere  
28-31 October 2013 in Espoo (Helsinki), Finland

### Monday, October 28

10:30 - 13:30 Registration

12:30 - 13:20 Lunch

13:20 - 13:30 Opening

13:30 - 15:10 GNSS Reflectometry I (Oral)

*Session Chairs: Manuel Martín-Neira and Jens Wickert*

13:30 The NASA Cyclone Global Navigation Satellite System (CYGNSS) Mission

*M.P. Clarizia, S. Gleason, J. Johnson, A. O'Brien, A. Ridley, C.S. Ruf, Y. Yi, V. Zavorotny*

13:50 GEROS-ISS - GNSS Reflectometry, Radio Occultation and Scatterometry onboard the International Space Station

*J. Wickert, G. Beyerle, E. Cardellach, C. Förste, T. Gruber, A. Helm, M.P. Hess, P. Hoeg, N. Jakowski, M. Kern, O. Montenbruck, A. Rius, M. Rothacher, C.K. Shum, C. Zuffada*

14:10 PARIS In-Orbit Demonstration Mission: First End-to-End Breadboard Test Results

*M. Martín-Neira, J. Benito, M. Segarra, J. Herrero, A. Rius, A. Camps, A. Andrés-Bevide, A. Olea, P. Saameño, X. Ballesteros, R. Vilaseca, A. Navarro, J. Garriga, S. Ribo, H. Park*

14:30 System Performance Simulation of Spaceborne GNSS-R Altimeters

*H. Park, A. Camps, D. Pascual, H. Carreno-Luengo, A. Alonso-Arroyo, F. Martin, R. Onrubia*

14:50 TIGRIS Experiment: Characterizing a Typhoon with GNSS Reflectometry

*F. Fabra, W. Li, M. Martín-Neira, A. Rius, Y. Dongkai*

15:10 - 15:40 Coffee Break

15:40 - 17:20 GNSS Reflectometry II (Oral)

*Session Chairs: Manuel Martín-Neira and Serge Reboul*

15:40 GNSS-R Experiments and Simulations for Soil and Vegetation Monitoring

*L. Guerriero, N. Pierdicca, A. Egido, M. Caparrini, S. Paloscia, E. Santi, N. Floury*

16:00 GNSS Reflectometry for Permittivity Retrieval of Wet Soil

*Y. Pei, R. Notarpietro, P. Savi, M. Pini*

16:20 Normalized GNSS Interference Pattern Technique

*S. Reboul, C. Botteron, M.A. Ribot, G. Stienne, J. Leclère, J.B. Choquel, M. Benjelloun, P.A. Farine*

16:40 MIR: the Microwave Interferometric Reflectometer, a New Airborne Sensor to Experiment Different GNSS-R Techniques

*R. Onrubia, D. Pascual, A. Camps, A. Alonso-Arroyo, H. Park*

17:00 3Cat-2: A Novel Approach to Space-borne GNSS-R Ocean Altimetry Using CubeSats

*H. Carreno-Luengo, A. Camps, I. Perez-Ramos, G. Forte, R. Onrubia, R. Díez, R. Jové*

17:30 - 19:00 Welcome Reception

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#### 8:20 - 10:00 Sensors and Calibration (Oral)

*Session Chairs: Yann Kerr and Paolo Pampaloni*

#### 8:20 The SMOS Mission After Almost 4 Years into Orbit: Main Results and Achievements

*Y.H. Kerr, P. Richaume, P. Waldteufel, J.-P. Wigneron, A. Al Bitar, F. Cabot, O. Merlin, A. Mialon, N. Reul, J. Boutin, J. Font, S. Mecklenburg*

#### 8:40 Performance of the Noise Injection Radiometers Onboard SMOS

*J. Kainulainen, A. Colliander, M. Martin-Neira, M. Hallikainen*

#### 9:00 Three Frequency Precipitation Profiling Radar in Helsinki

*W. Schmidt, K. Rautiainen, A.-M. Harri*

#### 9:20 Microwave Spectroradiometric Complex for Remote Sounding of the Earth Surface

*A.A. Shvetsov, V.G. Ryskin, L.M. Kukin, L.I. Fedoseev, A.M. Shchitov, V.M. Demkin*

#### 9:40 Microwave Sensor and Nanosatellite Research at Aalto University

*M. Hallikainen, J. Kainulainen, J. Praks, M. Vaaja*

#### 10:00 - 10:30 Coffee Break

#### 10:30 - 12:10 RFI in Remote Sensing (Oral)

*Session Chairs: Niels Skou and Janne Lahtinen*

#### 10:30 Detection of Spread Spectrum RFI Signals

*J. Lahtinen, J. Uusitalo, T. Ruokokoski, J. Ruoskanen*

#### 10:50 Active/Passive RFI Environment at L-Band

*D.M. Le Vine, P. de Matthaeis*

#### 11:10 SMOS, L Band and RFI: Where are we?

*Y.H. Kerr, P. Richaume, Y. Soldo, J. Pla, R. Oliva Balager, E. Daganzo, S. Nieto*

#### 11:30 Protection of the 1.4 GHz Passive Frequency Band from Radio Interferences

*P. Jokela*

#### 11:50 Radio Frequency Interference Maps to Locate Their Sources from a Fixed Location

*G. Forte, A. Camps, M. Vall-Ilossera*

#### 12:10 - 13:10 Lunch

#### 13:10 - 15:10 Remote Sensing of Land (Oral)

*Session Chairs: Kyle McDonald and Urs Wegmüller*

#### 13:10 Towards a Long-term Dataset of ELBARA-II Measurements in Support of SMOS Level-3 Product and Algorithm Validation at the Valencia Anchor Station (MELBEX Experiment 2010-2013)

*R. Fernández-Morán, J.-P. Wigneron, A. Coll Pajarón, Y. Kerr, M. Miernecki, P. Salgado-Hernanz, M. Schwank, E. Lopez-Baeza*

#### 13:30 Global Soil Frost Detection Using SMOS

*K. Rautiainen, J. Pulliainen, J. Lemmetyinen, A. Kontu, C.B. Menard, J. Ikonen, M. Schwank, C. Mätzler, A. Wiesmann*

#### 13:50 The Light Airborne Reflectometer for GNSS-R Observations (LARGO) Instrument: Towards Soil Moisture Retrievals

*A. Alonso-Arroyo, G. Forte, A. Camps, H. Park, D. Pascual, R. Onrubia*

#### 14:10 Soil Moisture Monitoring with SAR Time Series

*U. Wegmüller, M. Santoro, C. Werner*

#### 14:30 Flood Detection Using SAR Data: Key Radar Signatures and Possible Ambiguities

*N. Pierdicca, L. Pulvirenti, M. Chini, L. Guerriero*

#### 14:50 Statistical Modeling and Fusion of Multifrequency PolSAR Features for Improved Rural Area Land Cover Classification

*N. Gökhan Kasapoglu, T. Eltoft*

#### 15:10 - 15:40 Coffee Break

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#### 15:40 - 17:20 L-band Active/Passive Land Surface Retrievals and SMAP (Oral)

*Session Chairs: Thomas Jackson and Andreas Colliander*

#### 15:40 SMAP Status and Calibration/Validation Activities

*T.J. Jackson, E. Njoku, D. Entekhabi, P. O'Neill, A. Colliander*

#### 16:00 Estimation of High Resolution Soil Moisture with Radar and Radiometer by a Spectral Downscaling Technique

*J. Shi, P. Guo, L. Tsang*

#### 16:20 Monitoring Landscape Freeze/Thaw State with Microwave Remote Sensing: Characterization of the Terrestrial Carbon Cycle with NASA's Soil Moisture Active/Passive (SMAP) Mission

*K.C. McDonald, J.S. Kimball*

#### 16:40 Comparison of Airborne PALS Measurements with SMOS and Aquarius during SMAPVEX Field Experiment

*A. Colliander, T. Jackson, H. McNairn, E. Njoku*

#### 17:00 Soil Moisture Retrieval Using L-band Time-series Radar Observations Provided by Ground and Airborne Scatterometer and SAR Data

*S.B. Kim, L. Tsang, T. Jackson, A.C. Colliander, H. McNairn, J. van Zyl*

#### 15:10 - 17:40 Poster Session I

*Session Chairs: Jaan Praks and Juha Kainulainen*

#### P1 Advanced Concept of Scatterometer METEOR-3

*V. Karaev, M. Kanevsky, Y. Titchenko, M. Panfilova, E. Meshkov, G. Balandina, A. Shlaferov, Y. Kuznetsov*

#### P2 SSPA-Based Ku Band Transmitter-Receiver Module for D3MON Radar

*J. Lahtinen, T. Ruokokoski, J.-P. Porko, M. Vaaja, M. Toikka, M. Hallikainen*

#### P3 GROMOS-C, a New Ground Based 110 GHz Radiometer for Microwave Ozone Measurement Campaigns

*S. Fernandez, A. Murk, N. Kämpfer*

#### P4 GMES Sentinel-1 Soil Moisture Retrieval Algorithm Independent Assessment

*P. Snoeij, P. Imbo, T. Rabaut, N. Baghdadi, W. Wagner, F. Mattia, S. Paloscia, N. Pierdicca*

#### P5 Sentinel-1 Commissioning Phase Preparation

*P. Snoeij, D. Geudtner, B. Rommen, M. Brown, I. Navas-Traver*

#### P6 Intra-city Urban Heat Island: A Case Study for Delhi City.

*N. Yadav, C. Sharma*

#### P7 Speckle Statistics and Coherency Matrix of L Band Polarimetric SAR over Bare Soil with Rough Surfaces using Numerical 3D Simulations of Maxwell Equations

*K.-L. Chen, K.-S. Chen, L. Tsang, T. Hao Liao*

#### P8 Airborne Radiometer Measurements of Soil Moisture in Boreal Areas

*J. Seppänen, J. Kainulainen, M. Hallikainen*

#### P9 SMOS Satellite Soil Moisture Data Assimilation in the Watershed Modeling and Forecasting System in Finland

*T. Vento, J. Jakkila, T. Rousi, B. Vehviläinen*

#### P10 Influence of Radio Frequency Interference on SMOS Measurements over Finland

*J. Kainulainen, J. Seppänen, M. Hallikainen,*

#### P11 Modelling of TanDEM-X-Measured Forest Height from Small Footprint Lidar Data

*M.J. Soja, L.M.H. Ulander*

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### Wednesday, October 30

**8:20 - 10:00 Microwave Propagation in Vegetated and Snow Covered Soils: A Session in Honor of Paolo Pampaloni (Oral)**  
*Session Chairs: Simonetta Paloscia and Roger Lang*

**8:20 30 Years of Research on Microwave Emission from Snow and Vegetation Covered Soils**  
*S. Paloscia*

**8:40 Exploiting the Effects of Snow Layering on the Retrieval of SWE from Active and Passive Microwave Measurements**  
*E.Santi, S.Paloscia, P.Pampaloni, S.Pettinato, X.Chuan, M.Brogioni, G.Macelloni, E.Palchetti*

**9:00 Microwave Snow Backscattering Modeling based on Three-dimensional Microstructure Reconstructed from Two-dimensional Snow Section Image**  
*J. Shi, L. Tsang*

**9:20 Radar Scattering Signatures of Terrestrial Snow at X and Ku Band with a Multi-layer DMRT Model combined with NMM3D Boundary Conditions**  
*S. Tan, W. Chang, X. Xu, L. Tsang, J. Lemmetyinen, S. Yueh*

**9:40 Modeling of Active and Passive Microwave Signatures over Grass**  
*L. Dente, L. Guerriero, Z. Su, P. Ferrazzoli*

**10:00 - 10:30 Coffee Break**

**10:30 - 12:10 Remote Sensing of Snow (Oral)**  
*Session Chairs: Leung Tsang and Jiancheng Shi*

**10:30 Understanding L-band Data Acquired by SMOS over Antarctica Using in situ Measurements and Electromagnetic Modelling**  
*M. Leduc-Leballeur, G. Picard, A. Mialon, E. Lefebvre, C. Rüdiger, Y. Kerr, F. Dupont, L. Arnaud, M. Fily*

**10:50 Radarsat and Snow Character at Greenland Summit**  
*T. Manninen, P. Lahtinen, K. Anttila, A. Riihelä*

**11:10 Active and Passive Microwave Signatures of Seasonal Snow Cover: Four Years of the NOSREC Campaign**  
*J. Lemmetyinen, J. Pulliainen, A. Kontu, A. Wiesmann, C. Mätzler, H. Rott, T. Nagler, K. Voglmeier, A. Meta, A. Coccia, M. Schneebeli, M. Proksch, M. Davidson, D. Schüttemeyer, M. Kern*

**11:30 Comparison of Snow Water Equivalent Estimates of CMIP5 Climate Model Simulations and Satellite-based Data**  
*K. Luoju, J. Pulliainen, M. Takala, J. Lemmetyinen, T. Smolander, J. Ikonen, J. Cohen, C. Derksen*

**11:50 Simulations of Microwave Brightness Temperature of Snow Using HUT Snow Emission Model with SNOWPACK and in situ Measurements**  
*A. Kontu, J. Vehviläinen, J. Lemmetyinen, J. Pulliainen*

**12:10 - 13:10 Lunch**

**13:10 - 14:50 Remote Sensing of Snow and Ice (Oral): A Session in Memory of Richard K. Moore**  
*Session Chairs: Prasad Gogineni and Martti Hallikainen*

**13:10 Airborne Ultra-Wideband Microwave Radars for Snow Measurements**  
*S. Gogineni, J.B. Yan, F. Rodriguez-Morales, C. Leuschen, B. Panzer, D. Gomez-Garcia, A.E. Patel, J. Paden, M.A. Aziz*

**13:30 Experimental Brightness Temperature of Snow on Lake Ice**  
*M. Hallikainen, M. Vaaja, J. Seppänen, A. Hakkarainen, J. Kainulainen*

**13:50 Shortwave Broadband Black-sky Surface Albedo Estimation for Arctic Sea Ice Using Passive Microwave Radiometer Data**  
*V. Laine, T. Manninen, A. Riihelä, K. Andersson*

**14:10 Incidence Angle Dependence of HH/HV-polarized RADARSAT-2 SAR Backscattering over Homogeneous Ice and Open Water Regions**  
*J. Karvonen*

**14:30 On Estimation of Melt Pond Fraction on the Arctic Sea Ice with ENVISAT WSM Images**  
*M. Mäkynen, S. Kern, L.T. Pedersen*

**14:50 - 15:20 Coffee Break**

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## Wednesday, October 30

### 15:20 - 17:00 Remote Sensing of Forest and Vegetation (Oral)

*Session Chairs: Thuy Le Toan and Lars Ulander*

#### 15:20 A P-band SAR for Global Forest Biomass Measurement: the BIOMASS Mission

*T. Le Toan*

#### 15:40 Topographic Effects in P-band Polarimetric SAR of Boreal Forests

*L.M.H. Ulander, G. Sandberg, M.J. Soja*

#### 16:00 Analysis of Multitemporal Fully Polarimetric Radarsat-2 Data over Boreal Forest Zone for Land Cover Mapping

*O. Antropov, Y. Rauste, T. Häme*

#### 16:20 Temporal Variability of X-band Extinction Coefficient in Boreal Forest

*J. Praks, O. Antropov, M. Hallikainen*

#### 16:40 Multiple Scattering Effects in Radar Signatures from an Isolated Tree

*Q. Zhao, R.H. Lang*

### 14:50 - 17:20 Poster Session II

*Session Chairs: Jaakko Seppänen and Matti Vaaja*

#### P12 Advanced Radar Applications for Nano- and Microsatellites

*M. van den Oever, J. Jussila, A. Kestila, P. Laurila, R. Modrzewski*

#### P13 Passive Microwave Emissivity Validation and Characteristic Analysis

*L. Shi, Y. Qiu*

#### P14 Comparison of Microwave Radiometer Observations and Grain Size of Snow

*L. Leppänen, A. Kontu, J. Lemmetyinen, J. Pulliainen*

#### P15 Correction of Ionospheric Effects on SAR Interferometry Using an Combined TEC Estimator

*J.S. Kim, K. Papathanassiou*

#### P16 Precursors of Convective Activity Using Ground Based Microwave Radiometer

*S. Das, A. Maitra*

#### P17 Thermal Structure of the Boundary Layer under Strongly Stable Stratification

*I. Repina, M. Varentsov, E.N. Kadygrov, E.A. Miller*

#### P18 Including the Zeeman Effect in Retrievals of Stratospheric Temperature Profiles from a Ground-based Microwave Radiometer

*C. Straub, O. Stähli, F. Navas-Guzman, N. Kämpfer, R. Larsson, S.A. Buehler, P. Eriksson*

### 19:30 - 22:00 Symposium Dinner

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## Thursday, October 31

### 8:20 - 10:00 Remote Sensing of Precipitation (Oral)

*Session Chairs: V. Chandrasekar and Francisco Navas-Guzman*

#### 8:20 Dual-polarized Microwave Signatures of Precipitation from Earth and Space Between 3 GHz to 95 GHz

*V. Chandrasekar, D. Moisseev, L. Baldini, N. Bharadwaj, F. Junyeant, M. Le, H. Chen, R. Bechini, M. Vega*

#### 8:40 Dual-polarization Radar Observations of Hail

*L. Nevvonen, D. Moisseev, V. Chandrasekar, H. Pohjola*

#### 9:00 Linking Snowflake Microphysics and Radar Scattering Models

*J. Leinonen, D. Moisseev, T. Nousiainen*

#### 9:20 Comparison of the Melting Layer Model Characteristics with GPM Ground Validation Campaign Data

*A. von Lerber, D. Moisseev, A. Heymsfield, A. Bansemer, A.-M. Harri, M.T. Hallikainen*

#### 9:40 Influence of Snowflake Aggregation on Polarimetric Radar Signatures in Snow Storms

*S. Lautaportti, D. Moisseev, P. Saavedra, A. Battaglia, V. Chandrasekar*

### 10:00 - 10:30 Coffee Break

### 10:30 - 12:10 Remote Sensing of Precipitation and Atmosphere (Oral)

*Session Chairs: Animesh Maitra and V. Chandrasekar*

#### 10:30 Modelling X-band SAR Observations of Precipitating Clouds over Land and Sea Using C-band-dual Polarization Weather Radar

*L. Baldini, N. Roberto, R. Cremonini, R. Bechini, L. Facheris, V. Chandrasekar*

#### 10:50 Radar and Radiometric Studies of Rain Structure at a Tropical Location

*A. Maitra, A. Adhikari, S. Talukdar, A. Bhattacharya*

#### 11:10 Atmospheric Observations and Laboratory Measurements of a Broadband 340 GHz Receiver System for STEAMR

*M. Renker, A. Murk, N. Kaempfer, M. von Gruenigen, A. Emrich*

#### 11:30 Study of Cloud Effect on the Tropospheric Temperature Retrievals

*F. Navas-Guzman, O. Stähli, N. Kämpfer*

#### 11:50 First Continuous Middle-atmospheric Wind Profile Measurements with a Ground-based Microwave Doppler-spectro-radiometer

*R. Rüfenacht, N. Kämpfer, A. Murk, P. Eriksson, S.A. Buehler*

#### 12:10 Closing Remarks