COMMISSION F: Wave Propagation and Remote Sensing (November 2016 – October 2020)

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1. Summary

We have regular commission meetings for information exchange. URSI-F has organized monthly meeting, where we have oral presentations on electromagnetic wave propagation and remote sensing. The time for questions and discussion is unlimited, to have very intensive discussions. Due to COVID-19, we suspended most of the meetings in 2020, but we plan to have it online.

2. Activity Report

1. Commission meetings in the period of November 2016-October2020

1. Dec. 7, 2016 NICT , Koganei, Tokyo
   5 committee members attended
   Dissuasion and decision of the organization of the executive committee
   Schedule of meetings in FY 2017

2. May 31, 2017 The University of Electro-Communications, Chofu, Tokyo
   6 committee members attended
   Dissuasion and decision of the organization of the executive committee
   Discussion on URSI-GASS2017
   Schedule of meetings in FY 2017

3. March 19. 2018
   Dissuasion and decision of the organization of the executive committee
   Schedule of meetings in FY 2018

4. May 9, 2018 Tokyo Institute of Technology
   5 committee members attended
   Dissuasion and decision of the organization of the executive committee

5. March 7, 2019 NTT Yokosuka R&D center
   5 committee members attended
   Schedule of meetings in FY 2019
   Dissuasion and decision of the organization of the executive committee
   Discussion on editing the URSI Centenary Book

6. June 20, 2019 The University of Electro-Communications, Chofu, Tokyo
   6 committee members attended
   Schedule of meetings in FY 2019
   Discussion on URSI-JRSM2019

7. December 25, 2019, NICT, Koganei, Tokyo
   5 committee members attended
   Schedule of meetings in FY 2020
   Discussion on URSI-GASS

2. Meetings

(1) No.609 Meeting November 24-25, 2016, Kyoto International Community Hall
Special lecture by Dr.Tokio Taga
[1] Development and Perspective of Path Shadowing Model

(2) No.610 Meeting December 7, NICT, 2016, Tokyo
[1] Experimental Study to Measure Radio Path Loss between Wireless LAN (WLAN) Access Points (APs) and between an AP and a WLAN Client Terminal (CL) Deployed in Indoor Offices with Different Building Structure
[2] Deriving Empirical Formulas of the Radio Path Loss between APs and between the AP and the CL from Data Measured by Using WLAN AP Cisco CAP3702I for Supplementing Recommendation ITU-R P.1238
[3] A Preliminary Experimental Investigation of BLE-based Fingerprinting using Raspberry Pi
[4] Radio Wave Propagation Measurements and Path Loss Modeling in Outdoor Agriculture Environment for Wireless Sensor Network

(3) No.611 Meeting January 19-20, 2017, Hiroshima
This meeting was co-sponsored by IEICE Technical Committee on AP, WPT and IEEE AP-S Kansai Chapter.
Eight papers relevant to the field of URSI-F were presented:
Organized Session "Propagation" (Organizer: Prof. Hisato Iwai (Doshisha Univ.))

[1] [Propagation Model Contest]Trial of Propagation Model Contest
[2] [Propagation Model Contest]Modeling of Propagation Loss of Ray-Tracing Data in an Urban Cellular Environment Based on Physical Considerations of Dominant Arriving Waves
[3] [Propagation Model Contest] Propagation Modeling Focusing Dominant Propagation Paths

(4) No.612 Meeting March 10, 2017, NTT, Yokosuka
[1] SHF Band Path Loss Characteristics Considering Human Body Shadowing in a Crowded Area
[2] On Capacity of Multipath Fading Channels
[3] Non Destructive Inspection of Periodic Structure Target Using Broadband Polarimetry for Terahertz Radiation
[4] Mapping atmospheric water vapour by SAR interferometry: from measurement to assimilation into a Numerical Weather Model"

(5) No.613 Meeting April 26, 2017, Tohoku University
[1] A Study of 3D Measurement from Synthetic Aperture Radar Images Using Stereo Vision
[2] Researches in Numerical Simulation of Short Wave Propagation with Account for Global 3D Models of Ionosphere and Terrestrial Magnetic Field
[3] On the Use of EM Propagation and GB-SAR Interferometry to Estimate the Atmosphere Phase Delay in a Scene
[4] Estimation of Cross-Polarization Discrimination Characteristics of Ka-band Satellite Communication Signals in Thunderstorm Events

(6) No.614 Meeting May 18-19, 2017, Miyazaki Hotel Merieges
Special Lecture by Dr. Toshifumi Moriyama
[1] Polarimetric and Interferometric Analyses of Earthquake Damage areas by Using Synthetic Aperture Radar

(7) No.615 Meeting May 31,2017, University of Electro Communication
[1] Electromagnetic precursory phenomena associated with the 2016 Kumamoto earthquake
[2] Thundercloud electric field fine structure and lightning initiation in subcritical electric field
[3] K-Factor of Nakagami-Rice Distribution estimated by Moment-Method in analyzing Received Power Data Measured in Wireless LAN in an Indoor Office - Based on Computer Experiment to find the optimum number of data for the Moment-Method -
[4] On Capacity of Multipath Fading Channel (Part 2)- For Application to Adaptive Baseband Radio -

(8) No.616 Meeting July 27-28,2017, Nagoya Institute of Technology
This meeting was co-sponsored by IEICE Technical Committee on AP, SANE, SATand IEEE AP-S Nagoya Chapter, IEEE AES Japan Chapter
Three papers relevant to the field of URSI-F were presented:
AP Organized Session "Propagation" (Organizer: Dr. Hisato Iwai (Doshisya Univ.))

[1] The Delay and Directional Characteristics of Propagation Channels from 3GHz Band to 28GHz Band in

Indoor Environment
[2] Radio Propagation Prediction Method with Point Cloud Data in Indoor Office Environments for 26 to 66 GHz Bands
[3] Path Loss Characteristics of Human Bodies Blockage Considering Multi-Path in Outdoor Crowded Areas

(9) No.617 Meeting September 7, 2017, Hiroshima City University

[1] Proposal of Housing-site Human Detection System using Specified Low-power Radio and Evaluation of the Radio Propagation Characteristics
[2] Frequency Characteristics of the Range of 30 MHz - 5 GHz in Micro-Cell for Mobile Propagation
[3] Evaluation of required time for key generation in secret key agreement scheme based on radio wave propagation characteristics over non line-of-sight Intersections

(10) No. 618 Meeting October 4-5, 2017, Maison Franco-Japonaise (Tokyo)

This workshop was co-sponsored by IEICE SANE

Workshop on GPR measurements of active faults and tsunami sediments
Organized by Motoyuki Sato(Tohoku Univ), Maksim Bano(IPGS/Strasbourg Univ.)

[1] GPR measurements to assess the characteristics of active faults in Mongolia
[2] Fault detection in the Curah Lengkong at Mt Semeru in Indonesia: Topographic and Ground Penetrating Radar evidences
[3] Application for GPR survey to faults in Mogod Earthquake in central Mongolia
[4] Interpretation of GPR survey of subsurface layer structure of the west coast fault zone at Aomori bay
[5] Distribution of paleo-tsunami deposits in the eastern Taiwan using Ground Penetrating Radar
[6] Eroded Coastal Dune and Deposits in North Sumatra (Indonesia) following the 2004 Boxing Day Tsunami - a Geophysical Approach
[7] Delineation of Tsunami Deposites by an Array GPR System "Yakumo"

Workshop on Subsurface Electromagnetic Measurements
Organized by Motoyuki Sato (Tohoku University)

[1] Development of Non-Destructive Inspection Sensor for Wooden Structures (7) -- Demonstration Test of 3D Imaging in Wooden House Wall Model –
[2] POLARIMETRIC IMAGING of FULL POLARIMETRIC GPR
[3] Acoustic wave transducers as Ground Penetrating RADAR cooperative targets for sensing applications
[4] Preliminary Experiment of Sea Ice Thickness Measurement by Ground Penetrating Radar
[5] A practical approach for high-resolution pavement inspection with multistatic array GPR YAKUMO
[6] Nondestructive inspection of pavement by MIMO GPR ”Yakumo”
[7] Characterizing Peat Thickness Based on Common Mid Point (CMP) Ground Penetrating Radar -- A Preliminary Result --
[8] L- and S-band SAR backscatter modelling for lunar subsurface water ice detection
[9] Unsupervised Adaptive PolSAR Land Classification System Using Quaternion Neural Networks 2.5 Dimenstional EM and seismic wave modelling
[10] Development of landmine visualization systems based on complex-valued self-organizing-map (CSOM)
[11] Random noise de-noising and direct wave eliminating based on SVD method for ground penetrating radar signals
[12] Recent activities on archaeological survey by GPR-- Case study in Inari-yama Kofun --
[13] Diagnosing deterioration of tree trunks using GPR
[14] Railway Structures Inspection Method using G.P.R. -- Inspection precision improvement and improvement of the workefficiency for tunnnel lining and railroad-bed --

(11) No. 619 Meeting October 19-20, 2018, Hachinohe Commerce and Industry Building (Aomori)

This meeting was co-sponsored by IEICE Technical Committee on AP and IEEE AP-S Tokyo Chapter.
URSI-F Special Lecture
Multiple scattering of electromagnetic waves in random media , Prof.Shigeo Ito (Toyo Univ.)

(12) No. 620 Meeting December 13, 2018, NICT (Tokyo)

[1] Experimental Study of Estimating a Service Area based on a Relationship between Number of Wireless LAN Client Terminals Associated with a Micro Cell added on a Macro Cell Operated by Dual 5GHz

Band Mode of Cisco AP3802I and Number of Seats Prepared in the Cell in a Non-Territorial Office
[2] TRMM (Tropical Rainfall Measurement Mission) –Rainfall radar from the beginning to the end-
[3] Experimental study on 3D imaging of basic targets using Polarimetric-HoloSAR
[4] Software defined radio implementation of passive RADAR using low-cost DVB-T receivers

(13) No. 621 Meeting January 18-19, Advanced Telecomunications Research Institute International (ATR) Kyoto

This meeting was co-sponsored by IEICE Technical Committee on AP, WPT and IEEE AP-S Kansai Chapter.
Eight papers relevant to the field of URSI-F were presented:

Organized Session "Propagation" (Organizer: Prof. Hisato Iwai (Doshisha Univ.))

[1] Human Body Shadowing in an Indoor Environment at 26.4GHz and 66.5 GHz band
[2] Shadowing Effect of Obstacles on Millimeter-wave Band Propagation Channel in Indoor Environment
[3] Measurement evaluation of human body blocking for inter-network interference of 60-GHz-band WBAN
[4] Effect of the Object Inside a Tunnel in the Radio Wave Propagation of a Subway Tunnel
[5] Evaluation of Aircraft Cabin- to-Exterior Propagation Characteristics for 4.4 GHz-band WAIC Systems using a Large Scale FDTD Analysis
[6] Radio Propagation Prediction Method Using Point Cloud Data in NLOS Urban Environments for high frequency bands
[7] Prediction Method using Machine-Learning for Path Loss Characteristics Considering Several Blockages in An Open-Square Environment
[8] Power Distribution Measurement for the Communication Quality Visualization in the Drone Flight Area

(14) No. 622 Meeting March 19, 2108, NTT Yokosuka development Center

[1] Digital Transmission Analysis from Propagation Viewpoint - BER due to ISI in the case of MRC Diversity –
[2] The Time Difference Analysis Between Rain Attenuation and Rainfall Intensity by Rain Cell Model in the Ka Band Satellite Communications
[3] Shadowing Effect of Obstacles on Millimetre-wave Band Propagation Channel in Indoor Environment
[4] Identification of Scattering Objects in 11GHz Urban Microcell Radio Propagation Channels via Visual Inspection of 3D Images

(15) No. 623 Meeting May 9, 2018, Tokyo Institute of Technology

[1] Current status of water vapor estimation method using terrestrial digital broadcasting wave
[2] Frequency Dependency Analysis of Multipath Clusters of Indoor Propagation Channel in SHF Bands
[3] Development of 12GHz Band SIMO Channel Sounder using Radio-on-Fiber Technology

(16) No. 624 Meeting May 17-18, 2018, Kumamoto University

This meeting was co-sponsored by IEICE Technical Committee on AP and IEEE AP-S Fukuoka Chapter.
Three papers relevant to the field of URSI-F were presented:

AP Organized Session "Propagation" (Organizer: Dr. Yukiko Kishiki (KKE))

[1] A study on estimation of field strength passing through perpendicularly located windows
-- Double Aperture Field method for perpendicularly located apertures --
[2] An estimation of secondary radiation pattern for predicting outdoor to indoor radio propagation characteristics
[3] A study on correlated path shadowing model based on experimental data

(17) No. 625 Meeting June 13, 2018, Tokyo Metropolitan University Akihabara Satellite Campus

[1] Development of Phased Array Radar for Meteorological Survey
[2] Revisited to Bello's WSSUS Channel Model
[3] The urban structural model for the propagation loss in microcell applied to a scale model

(18) No. 627 Meeting September 7, 2018, Osaka Electro-communication University Neyagawa, Osaka

[5] 150MHz～5GHz Outdoor-to-Indoor Propagation Loss Depending on the Distance from a Window for Interference Between the Indoor Base Stations
[6] Relationship between Ground Wind Velocity around the Earth Station and Rain Attenuation Observation at 3 Locations in Ku-Band Satellite Communications Link
[7] Yearly Variation of Up and Down Link Rain Attenuation Characteristics of Ku-Band Satellite Communications in the Tropical Region

(19) No.628 Meeting 18 October (Okayama University)
This meeting was co-sponsored by IEICE Technical Committee on AP and IEEE AP-S Tokyo Chapter.
URSI-F Special Lecture
[1] Studies on Radio wave Propagation and Remote Sensing -Experiencing both Research Fields-
Yasuyuki Maekawa (Osaka Electro-Communication University)

(20) No.629 Meeting November 8, 2018, Tohoku University Tokyo Satellite
[1] Examination of propagation loss prediction method in urban area
- - Examination in propagation prediction contest - -
[2] How accurately can the simple scattering model explain the practical time-spatial propagation characteristics in mobile communication?

(21) No. 630 Meeting December 7, 2018, NICT , Koganei, Tokyo
[1] Disaster Monitoring of Hokkaido- Iburi-Tobu Earthquake 2018 Using ALOS2 Quad Pol Data
[2] Experimental study on Polarimetric-HoloSAR
[3] Throughput Measurement to Evaluate Performance of Downlink Multi-User MIMO in IEEE 802.11ac Wireless LAN in an Indoor Office Environment
[4] Proposal of APS compensation by Polarimetric GB-SAR

(22) No.631 Meeting, 18 January 2019, Toyota Automobile Museum
This meeting was co-sponsored by IEICE Technical Committee on AP and IEEE AP-S Nagoya Chapter.

[1] Study on Characteristics of Arrival Angular Spread at High Microwave-band
[2] Basic Study on Propagation Characteristics for Indoor Industrial Scenario
[3] Path Loss Prediction of Multiple Human Body Shadowing in an Indoor Environment Considering Reflection wave from ceiling

(23) No.632 Meeting, March 7, NTT Yokosuka R&D center
[1] Long-term statistics of maximum rainfall in Japan based on statistics of extremes
[2] Atmospheric phase screen compensation method under spatially heterogeneous atmospheric conditions by means of fully polarimetric information for precise landslide monitoring by GB-SAR

Special session for Memorial of Prof. Akio Sato
[1] EM Propagation and Prof. Akio Sato Naoki Kita (NTT)
[2] With the Tutor of EM propagation Prof. Akio Sato Teruaki Yoshida (Hiroshima City University

(24) No. 633 Meeting May 7, 2019, Tokyo Tech Front, Tokyo Institute of Technology, Ookayama, Tokyo
[1] Examination of the clutter loss for urban areas in millimeter wave and visible light
[2] Cluster Frequency Dependency Analysis in Indoor Environments at Microwave and Millimeter Wave Bands
Special session for Memorial of Prof. Takehiko Kobayashi
[1] Radio wave propagation experiment with Prof. Takehiko Kobayashi
[2] In memory of Prof. Takehiko Kobayashi -UWB Research and Space Science-

(25) No.634 Meeting 16 May, 2019, Kanpo-no Yado Arima, Kobe, Hyogo
This meeting was co-sponsored by IEICE Technical Committee on AP and IEEE AP-S Kansai Joint Chapter.
URSI-F Special Lecture
[1] Time-spatial propagation model for cell design by using 2-dimenzional massive MIMO arranged on vertical and horizontal planes
Teruya Fujii (Titech)

(26) No.635 Meeting June 20, 2019, The University of Electro-Communications, Chofu, Tokyo

[1] Prediction of Rain Attenuation of Millimeter-Wave Radio by Hybrid T-matrix Approach
[2] Experimental Study of Finding out Decreased Transmission Power on Client Terminals in Order to Operate Uplink Multi-User Transmission Properly in IEEE 802.11ax Wireless LAN
[3] Channel Capacity of Massive MIMO in Correlated Fading Environments

(27) No. 636 Meeting July 17-19, 2019, Sakura Hall, Tohoku University, Miyagi, Sendai
This meeting is co-sponsored by IEICE Technical Committee on AP and IEEE AES Society Japan Chapter.
[1] High-resolution horizontal permittivity distribution estimation of pavement using array ground penetrating radar
[2] Examination of Dependency of Elastic Modulus of Concrete on Vibration Displacement by Vibro-Radar Method
[3] Development of RC Doppler radar for hand drill tip monitoring
[4] Antenna Design of a Passive Cooperative Target For concrete temperature monitoring
[5] Study on Miniaturization of Bowtie Antenna with Folded Structure for Ground Penetrating Radar
[6] Application of Cross -Bowtie Antenna to Detection of Buried Pipes by GPR
[7] Propagation Loss Estimation considering Ray Tracing Results for Deep Learning Input Data
[8] Development of Radio Propagation Channel Model for Millimeter-Wave Indoor Multi-Gigabit Access Links
[9] Additional Loss of Each Arrival Angle at 4.7 GHz and 26.4 GHz Bands in Crowded Environments
[10] Propagation Characteristics in a L-shaped Corridor by Antenna Directivity at 28 GHz Band

(28) No. 637 Meeting
Adjournment due to URSI-JRSM 2019

(29) No. 638 Meeting October 17, 2019, Sigma Hall, Toyonaka Campus, Osaka University, Toyonaka-shi, Osaka
This meeting is co-sponsored by IEICE Technical Committee on AP and IEEE AP-S Kansai Joint Chapter.
URSI-F Special Lecture
[1] Remote vital sensing with mm-wave UWB radar
Toru Sato, Takuya Sakamoto (Kyoto Univ.)

(30) No. 639 Meeting Nobember 20-22, 2019, Honjo-Campus, Saga University, Saga-city, Saga
This meeting is co-sponsored by IEICE Technical Committee on AP, IEICE Technical Committee on Radio Communication Systems, and IEEE AP-S Fukuoka Chapter.
[1] Proposal of location estimation with high resolution using unmanned aerial vehicle
[2] Simultaneous Heartbeat Detection of Multiple Targets Using Amplitude Equivalent Component in Pseudo-Arctangent Demodulation
[3] Measurement of Diffused Scattering on Rough-Surface Walls and Intra-Cluster Modeling at Millimeter-Wave band

(31) No. 640 Meeting December 25, 2019, NICT , Koganei, Tokyo
[1] Experimental Study Based on Monte Carlo Method to Estimate the Reduction Range of Transmission Power Control at Client Terminals in IEEE 802.11ax Uplink Multi-User Transmission
[2] Rain Attenuation Fluctuation Characteristics due to Typhoon Passage in Ku-band Satellite Links

(32) No. 641 Meeting January 23-24, 2020, Sunport Hall Takamatsu, Takamatsu-shi, Kagawa
This meeting is co-sponsored by IEICE Technical Committee on AP, IEICE Technical Committee on WPT, and IEEE AP-S Kansai Joint Chapter.
[1] Examination of the Mechanism of Building Penetration Loss of UHF band by Scale Model
[2] Analysis of Estimation Error by Position Mismatch on Machine-Learning Path Loss Prediction in Urban Environment
[3] A study on propagation modeling of urban low altitude environment

(33) No. 642 Meeting
Adjournment due to COVID-19

(34) No. 643 Meeting
Adjournment due to COVID-19

(35) No. 644 Meeting
Adjournment due to COVID-19

(36) No. 645 Meeting
Adjournment due to COVID-19

(37) No. 646 Meeting July 15-17, 2020, Online
This meeting is co-sponsored by IEICE Technical Committee on AP, IEICE Technical Committee on SANE, IEICE Technical Committee on SAT, and IEEE AES Society Japan Chapter.
[1] Radio Wave Propagation Model for Radiozone Design at High Frequency Band

(38) No,647
Adjournment due to COVID-19

(39) No.648
Special Lecture by Dr. Akitsugu Nadai
Application of Airborne Altimeter to Tsunami Detection

3. References

For more detail, please see http://ursi-f.nict.go.jp/)