

IRS 2018

International Radar Symposium June 20-22, 2018, Bonn, Germany



PROGRAMME

Tuesday, June 19, 2018

- 14:00 - 20:00** **Symposium Registration** (Maritim Hotel, Conference area)
- 15:00 - 19:00** **VISIT TO SPACE OBSERVATION RADAR TIRA** (only registered attendees)
The bus transfer from the Maritim Hotel to the TIRA facility will be provided by the IRS organizers at 15:00.
The return busses will start at approx. 18:00 from FHR and bring the visitors back to the Maritim Hotel in Bonn.
- 18:00 - 21:00** **GET-TOGETHER RECEPTION** (Foyer in front of Saal Beethoven, Saal Schumann and Saal Reger in Maritim Hotel)

Wednesday, June 20, 2018

- 08:00 – 16:00** **Symposium Registration** (Maritim Hotel, Conference area)

SAAL BEETHOVEN

08:30 - 10:20 **OPENING SESSION**

Chairs:

- Prof. Dr. Peter Knott**, Chairman of the International Radar Symposium IRS 2018
Fraunhofer Institute for High Frequency Physics and Radar Techniques (FHR), Germany
- Prof. Dr. Hermann Rohling**, Co-Chairman of the International Radar Symposium IRS 2018
German Institute of Navigation (DGON), Germany
- Prof. Dr. Krzysztof Kulpa**, Co-Chairman of the International Radar Symposium IRS 2018
Warsaw University of Technology, Poland

- 08:30** **Welcome Speech**
Peter Knott
Fraunhofer Institute for High Frequency Physics and Radar Techniques (FHR), Germany
- 08:40** **Welcome Note**
Victoria Appelbe,
Economic Development Office, City of Bonn, Germany
- 08:50** **Future Technological Challenges on High Performance Radars**
Ryszard Bil, Michael Brandfass, Johannes-Pieter van Bezouwen
HENSOLDT Sensors GmbH, Germany
- 09:10** **Radar Systems and Challenges for C-UAV**
Peter Wellig, Peter Speirs, Christof Schuepbach, Roland Oechslin, Matthias Renker, Urs Boeniger, Hans Pratisto
armasuisse Science and Technology, Switzerland
University of Bern, Switzerland
- 09:30** **Radar Automation and Digitalization in the Resources Industry**
Reik Winkel
indurad GmbH, Germany
- 09:50** **NewSpace: A Game Changer for Low-Cost Spaceborne SAR Missions**
Alberto Moreira
German Aerospace Center (DLR), Germany
- 10:10** **Organisational Remarks**

10:20 - 10:50 *Coffee Break*

FOYER

08:30 - 16:30 Exhibition

FOYER

08:30 - 16:30 Poster Session 1 (during coffee-breaks and lunch)

Ubiquitous Imaging Radar: System Concept and Resolution Performance

Q. Zhang, M. Wu, W. Yu
China Academy of Electronics and Information Technology, China
Shanghai Jiao Tong University, China

Measurement of CHAFF RCS

J. Žak, L. Gregor, F. Dvořáček, V. Papež
Czech Technical University in Prague, Czech Republic
University of Defence in Brno, Czech Republic

A Case Study of the Beam Stabilization and Ground Clutter Measurement by a Cargo Aircraft Flight Trials

S. Jang, C. Ahn, G. Park, T. Kim, S. Kim
Agency for Defense Development, Republic of Korea
LIG Nex1, Republic of Korea

Automotive Radar Sensor Interference - Thread and Probable Countermeasures

H.-L. Bloecher, J. Dickmann
Daimler AG, Germany

Use of n-Vector for Radar Applications

N. Ødegaard, K. Gade
Norwegian Defence Research Establishment, Norway

Optimization of Nonuniform Linear Array Configuration for Reduced Number of Elements

X. L. Tran, J. Vesely, P. Hubacek, V.M. Duong
University of Defence, Czech Republic

Constrained Total Least Squares Localization Algorithm for Multistatic Passive Radar Using Bistatic Range Measurements

Y. Zhao, Y. Zhao, D. Sun, C. Zhao
National Digital Switching System Engineering and Technological Research Center, China
Luoyang Electronic Equipment Test Center, China

Improved Two-Step Weighted Least Squares Algorithm for TDOA-Based Source Localization

J.Y. Chen, Y. Zhao, C. Zhao, Y. Zhao
Chinese Academy of Military Science, China
National Digital Switching System Engineering and Technological Research Center, China

SAAL BEETHOVEN

10:50 - 12:50 Drone Detection

Session Chairs:
J. Klare, Germany
M. Jahangir, UK

10:50 Session Keynote:
Magenta Drone Detection

M. Pienzl
Deutsche Telekom, Germany

11:10 Improved UAV Detection with the MIMO Radar MIRA-CLE Ka using Range-Velocity Processing and TDMA Correction Algorithms

O. Biallawons, J. Klare, L. Fuhrmann
Fraunhofer FHR, Germany
University of Siegen, Germany

11:30 Drone Detection with X-Band Ubiquitous Radar

Á. Duque de Quevedo, F. Ibañez Urzaiz, J. Gismero Menoyo, A. Asensio López
Universidad Politécnica de Madrid, Spain

11:50 Experimental Results of Drone Detection Using Noise Radar

M. Zywek, G. Krawczyk, M. Malanowski
Warsaw University of Technology, Poland

12:10 Multisensor Data Fusion for UAV Detection and Tracking

S. Jovanoska, M. Brötje, W. Koch
Fraunhofer FKIE, Germany

SAAL SCHUMANN

10:50 - 12:50 Automotive Radar 1

Session Chairs:
U. Lübbert, Germany
P. Lombardo, Italy

Automotive Fast-Chirp MIMO Radar with Simultaneous Transmission in a Doppler-Multiplex

C. Sturm, Y. L. Sit, G. Li, H. Afrasiabi Vayghan, U.Lübbert
VALEO Schalter und Sensoren GmbH, Germany

Region of Interest Based Adaptive High Resolution Parameter Estimation with Applications in Automotive Radar

S. K.Dehkordi, N. Appenrodt, J. Dickmann, C.Waldschmidt
Daimler AG, Germany
University of Ulm, Germany

Pedestrian Classification with a 79 GHz Automotive Radar Sensor

R. Prophet, M. Hoffmann, M. Vossiek, C. Sturm, A. Ossowska, W. Malik, U.Lübbert
Universität Erlangen-Nürnberg, Germany
VALEO Schalter und Sensoren GmbH, Germany

24 GHz Interferometric Radar for Road Hump Detections in Front of a Vehicle

S. Melo, E. Marchetti, S. Cassidy, E. Hoare, A.Bogoni, M. Gashinova, M. Cherniakov
Scuola Superiore Sant'Anna, Italy
University of Birmingham, UK

Single-Frame Vulnerable Road Users Classification with a 77 GHz FMCW Radar Sensor and a Convolutional Neural Network

R. Perez, F. Schubert, R. Rasshofer, E.Biebl
Technical University of Munich, Germany
BMW Group, Germany

SAAL REGER

10:50 - 12:50 mm-Wave Radar

Session Chairs:
A. Bogoni, Italy
H. Rohling, Germany

Photonics for mmW Signal Generation

G. Serafino, F. Scotti, D. Onori, F. Falconi, F. Amato, P. Ghelfi, A. Bogoni
Sant'Anna School of Advanced Studies, Italy
National Laboratory of Photonic Networks, Italy

Ultra-High Resolution Radar Imaging Based on Microwave Photonics

Y. Zhang, F. Zhang, S. Pan
Nanjing University of Aeronautics and Astronautics, China

Enabling Technologies for High Performance Millimetre and Sub-millimetre Wave Radar

D.A. Robertson
University of St Andrews, Scotland

Digitally-Assisted Frequency Synthesizers for Fast Chirp Generation in mm-Wave Radars

S. Levantino, C. Samori
Politecnico di Milano, Italy

3D Mechanically Pivoting Radar System Using FMCW Approach

S. Nowok, G. Briese, S. Kueppers, R.Herschel
Fraunhofer FHR, Germany

12:30	L-band Staring Radar Performance Against Micro-Drones M. Jahangir, C. J. Baker <i>Aveillant, UK</i> <i>University of Birmingham, UK</i>	Enhanced Target Detection in High-Intensity Clutter Environments for Automotive Radar Systems J. Yoon, S. Lee, S.-C. Kim <i>Seoul National University, Republic of Korea</i>	High Precision Surface Reconstruction based on Coherent Near Field Synthetic Aperture Radar Scans S. Pawliczek, R. Herschel, N. Pohl <i>Institute of Integrated Systems, Germany</i> <i>Fraunhofer FHR, Germany</i>
	12:50 - 13:50 Lunch	12:50 - 13:50 Lunch	12:50 - 13:50 Lunch
	SAAL BEETHOVEN	SAAL SCHUMANN	SAAL REGER
13:50	13:50 - 15:30 Airborne Radar Session Chairs: W. Holpp, Germany B. Himed, USA	13:50 - 15:30 New Frontiers in Radar Imaging Session Chairs: E. Giusti, Italy D. Heberling, Germany	13:50 - 15:30 Compressive Sensing Session Chairs: J. Ender, Germany C. Enderli, France
13:50	Modular Demonstrator Testbed for Airborne Sense & Avoid Radar F. Schäfer, M. Strasser, L. Erdmann, S. Beer, D. Klarer, P. Feil <i>Hensoldt Sensors GmbH, Germany</i>	Doppler Beam Sharpening for Angular Refinement at 150 GHz – Initial Experimentation L. Daniel, S. Cassidy, D. Phippen, E. Hoare, A. Stove, M. Cherniakov, M. Gashinova <i>University of Birmingham, UK</i>	Detection of Moving Targets Using Off-Grid Compressed Sensing L. Prünte <i>Fraunhofer FHR, Germany</i>
14:10	Modular, Scalable Multifunction Airborne Radar Systems for High Performance ISR Applications M. Brandfass, A. Dallinger, K. Weidmann <i>Hensoldt Sensors GmbH, Germany</i>	Optimal CPI Selection Based on Doppler Spread and Image Contrast D. Cataldo, M. Martorella <i>University of Pisa, Italy</i>	Enhanced Microwave Imaging by Bilinear Compressed Sensing Y. Lu, W.-S. Benedix, C.H. Yu, J.T. Wang, D. Plettemeier <i>Technische Universität Dresden, Germany</i>
14:30	Radar and Optical Image Fusion Using Airborne Sensor Data from the Heligoland Island H. Anglberger, J. Fischer, D. Frommholz <i>DLR, Germany</i>	Passive ISAR for Maritime Target Imaging: Experimental Results I. Pisciotto, D. Cristallini, J. Schell, V. Seidel <i>Fraunhofer FHR, Germany</i>	Periodic Patterns Frequency Hopping Waveforms: From Conventional Matched Filtering to an Improved Compressed Sensing Approach P. Mesnard, C. Enderli, G. Lecue <i>Thales Systemes Aeroportes, France</i> <i>ENSAE ParisTech, France</i>
14:50	Multi-Channel Radar at 35 GHz for Airborne SAR-Applications M. Caris, F. Klöppel, J. Wilcke, T. Brehm, S. Sieger, R. Sommer, S. Stanko et al. <i>Fraunhofer FHR, Germany</i> <i>University of Zurich, Switzerland</i> <i>armasuisse, Switzerland</i>	Applications of a Modern Micro-SAR System for Small UAV Operations (From Active to Passive SAR Technology) P. Samczyński <i>Warsaw University of Technology, Poland</i>	Sparsity Aware Dynamic Gesture Classification Using Dual-band Radar L. Yang, G. Li <i>Tsinghua University, China</i>
15:10	Monopulse Radar for Obstacle Detection and Autonomous Flight for Sea Rescue UAVs M. Hägelen, R. Jetten, R. Kulke, C. Ben, M. Krüger <i>IMST GmbH, Germany</i> <i>RWTH Aachen University, Germany</i>	Frequency Adapter for Interferometric Applications (FADI) Technique for SAR Burst Mode D. Calabrese, D. Rizzato, A. Perrera, S. Federici <i>Thales Alenia Space, Italy</i>	Parametric Sparse Recovery for ISAR Imaging of Maneuvering Target Y. Xing, Y. Peng, S. Yong <i>National University of Defense Technology, China</i>
	15:30 - 16:00 Coffee Break	15:30 - 16:00 Coffee Break	15:30 - 16:00 Coffee Break
	SAAL BEETHOVEN	SAAL SCHUMANN	SAAL REGER
16:00	16:00 - 17:40 Passive Radar 1 Session Chairs: K. Kulpa, Poland D. O'Hagan, Germany	16:00 - 17:40 Detection of Vital Signs Session Chairs: F. Foelster, Germany I. Naidionova, Lithuania	16:00 - 17:40 Air Traffic Control Session Chairs: R. Mallwitz, Germany I. Balajti, Hungary
16:00	Multi Static Long Range Multi Band 3D Passive Radar - Latest Developments at Hensoldt Sensors S. Lutz, V. Winkler, R. Müller, C. Klöck <i>Hensoldt Sensors GmbH, Germany</i>	Vital Sign Localization and Measurement Using an LFMCW MIMO Radar F. Weishaupt, I. Walterscheid, O. Biallawons, J. Klare <i>Fraunhofer FHR, Germany</i>	Evaluation of Passive Multi-Static Primary Surveillance Radar for Operational Use in Civil Air Traffic Control H. Stahl, H. Fischer, S. Stanzel, C. Klöck, F. Bernhardt, G. Kouemou <i>Hensoldt Sensors GmbH, Germany</i> <i>DFS Deutsche Flugsicherung, Germany</i>
16:20	Countering Illegal UAV Flights : Passive DVB Radar Potentiality D. Poullin <i>ONERA, France</i>	4-Channel I/Q-Radar System for Vital Sign Monitoring in a Baby Incubator D. Schmiech, S. Müller, A.R. Diewald <i>Trier University of Applied Sciences, Germany</i>	Secondary Surveillance Radar Transponders Classification by RF Fingerprinting M. Leonardi, D. Di Fausto <i>Tor Vergata University of Rome, Italy</i>

16:40	Performance Assessment of the FM-based AULOS® Passive Radar for Air Surveillance Applications T. Martelli, R. Cardinali, F. Colone <i>Sapienza University of Rome, Italy</i> <i>Leonardo Company, Italy</i>	One-dimensional Patch Array for Microwave-based Vital Sign Monitoring of Elderly People S. Schäfer, A. R. Diewald, D. Schmiech, S. Müller <i>Trier University of Applied Sciences, Germany</i>	Target Filtering for Military ATC Primary Radar T. Huber-Obst <i>Hensoldt Sensors GmbH, Germany</i>
17:00	Multi Band FM and DVB-T2 Passive Radar Demonstrator S. Paine, F. Schonken, M. Malape, D.W. O'Hagan, J. Swart, F. Louw, M. Setsubi <i>University of Cape Town, South Africa</i> <i>Fraunhofer FHR, Germany</i> <i>Peralex Electronics, South Africa</i>	Radar-Camera for Microwave-Based Imaging and Vital Sign Monitoring Y. Mergen, D. Schmiech, S. Mueller, A. Diewald <i>Trier University of Applied Sciences, Germany</i>	Featureless Traffic Monitoring R. Thaens, C. Coman <i>NATO Communications and Information Agency, the Netherlands</i>
17:20	Target Velocity Estimation with Multistatic GNSS-based Radar M. Antoniou, H. Ma, A. G. Stove, M. Cherniakov <i>University of Birmingham, UK</i> <i>Xidian University, China</i>	Applying Singular Value Decomposition for Clutter Reduction in Heartbeat Estimation Using M-Sequence UWB Radar M. Mostafa, S. Chamaani, J. Sachs <i>K. N. Toosi University of Technology, Iran</i> <i>Technische Universität Ilmenau, Germany</i>	Improved Correction Methods for Measuring Altitude by Radar and Barometer W. Åsen <i>Norwegian Defense Research Establishment, Norway</i>

18:45 GUIDED CITY TOUR IN BONN (a walking tour with a meeting point at Kaiserplatz in Bonn)

Use metro lines U 63, 66 from Olof-Palme-Allee station near Maritim hotel to Universität/Markt station

Thursday, June 21, 2018

08:00 – 16:00 Symposium Registration (Maritim Hotel, Conference area)

FOYER

08:30 - 16:30 Exhibition

FOYER

08:30 - 16:30 Poster Session 2 (during coffee-breaks and lunch)

Clustering of Detected Targets Using DBSCAN in Automotive Radar Systems
S. Lim, S. Lee, S.-C. Kim
Seoul National University, Republic of Korea

Signal Time Delay Estimation Using Square Correlation Method and Wavelet Analysis
G. Tofel, G. Czopik, A. Kawalec
Military University of Technology, Poland

RCS of Radar Targets Using Gaussian Beam Summation Method. Experimental Evaluation
H. Ghanmi, A. Khenchaf, P. Pouliguen, P.O.Leye
ENSTA Bretagne, France
French General Directorate for Armament, France

Polarization Scattering Matrix Estimation for Moving Targets Using Measurement Selection
C. Li, Y. Yang, Y. Li, X. Wang
National University of Defense Technology, China

SAR Target Recognition via Joint Manifold Regularized Low-Rank Matrix Approximation
M. Yu, S. Zhang, L. Zhang, L. Zhao, G. Kuang
National University of Defense Technology, China

PSM Measurement for High-speed Targets Using Simultaneous Polarimetric Radar
Q. Liu, C. Pang, Y. Li, X. Wang, M. Zhu
National University of Defense Technology, China
Jiuquan Satellite Launch Center, China

Blind Velocities Mitigation For DDMA MIMO GMTI Radar Via Multi-Frequency Signals
F. Li, F. He, Z. Dong, M. Wu, Y. Zhang, Z. Sun
National University of Defense Technology, China

Analytical Effective Parameters of Artificial Structures
O. Ouchetto, S. Jai-Andaloussi, A. Sekkaki, S.Zaamoun
University Hassan II, Morocco

SAAL BEETHOVEN

08:30 - 10:30 Automotive Radar 2
Session Chairs:
A. Dankmayer, Germany
E. Hoare, UK

SAAL SCHUMANN

08:30 - 10:30 Passive Radar 2
Session Chairs:
M. Edrich, Germany
D. Poullin, France

SAAL REGER

08:30 - 10:30 Radar Applications
Session Chairs:
H. Mahnke, Germany
M. Malanowski, Poland

08:30 Application of a Stream-based SAR-Backprojection Approach for Automotive Environment Perception
T. Gisder, F. Harrer, E. Biebl
Volkswagen Group Research, Germany
perisens GmbH, Germany
Technische Universität München, Germany

DSI Suppression with Adaptive Beamforming in DVB-T Passive Radar Measurements
K. Strøm, Ø. Lie-Svendsen, I. Norheim-Næss, T. Johnsen, E. Finden, K.E. Olsen
Norwegian Defence Research Establishment (FFI), Norway

Y-Configured Three-Beam Doppler Navigation System as a Sea Wind Sensor
A. Nekrasov, A. Khachaturian
Southern Federal University, Russia
Saint Petersburg Electrotechnical University, Russia

08:50	Experimental Evaluation of Compressive Sensing for DoA Estimation in Automotive Radar A. Correas-Serrano, M. A. Gonzalez-Huici <i>Fraunhofer FHR, Germany</i>	Application of Terrestrial TV Transmitters for Long Range Passive Radar V. Winkler, R. Müller, S. Lutz <i>Hensoldt Sensors GmbH, Germany</i>	Low Frequency Signals Analysis for Range and Doppler High Resolution SODAR Applications M. Kniola, T. Rogala <i>Military University of Technology, Poland</i>
09:10	Blind Adaptive Beamforming for Automotive Radar Interference Suppression J. Bechter, A. Demirlika, P. Hügler, F. Roos, C. Waldschmidt <i>Ulm University, Germany</i>	Resident Space Object Passive Bistatic Radar Detection Using DVB-S2 Signals L. Gentile, A. Capria, M. Conti, C. Moscardini, M. Martorella <i>University of Pisa, Italy</i> <i>RaSS National Laboratory, Italy</i>	Generation of Modern Radar Scenarios Using Vector Signal Generators and Pulse Descriptor Words R. Lenz, A. Ascher, S. Heuel <i>Rohde & Schwarz GmbH, Germany</i>
09:30	A Novel Iterative Inter-Radar Interference Reduction Scheme for Densely Deployed Automotive FMCW Radars M. Umehira, T. Nozawa, Y. Makino, X.Wang, S.Takeda, H. Kuroda <i>Ibaraki University, Japan</i> <i>Hitachi Automotive Systems, Japan</i>	Multi-Bistatic Radar for Resident Space Objects Feature Estimation S. Ghio, M. Martorella <i>University of Pisa, Italy</i> <i>RaSS National Laboratory, Italy</i>	Subspace-Based Technique for Improvement of Shallow Buried Landmine GPR Imaging J. Jendo, M. Pasternak <i>Military University of Technology, Poland</i>
09:50	A Novel Approach to Measure the Automotive Radar Sensor's Robustness Against Interferers in the Lab with Realistic Scenarios A. Ascher, R. Lenz, S. Heuel <i>Rohde & Schwarz GmbH, Germany</i>	Analysis of Measurement Association Methods in PCL-PET Passive Location System M. Konopko, L. Lamentowski, W. Dyszyński, T. Brenner <i>PIT-RADWAR S.A., Poland</i>	A Study on a Possibility of Ball Detection in Sport Games: A Preliminary Verification Using Radar Measurements K. Stasiak, P. Samczynski, D. Gromek, B. Salski, P. Kopyt, J. Drozdowicz et al. <i>Institute of Electronic Systems, Poland</i> <i>JW Partners, Poland</i>
10:10	Iron Tunnel Recognition Using Statistical Characteristics of Received Signals in Automotive Radar Systems S. Lee, B.-H. Lee, H. Sim, S.-C. Kim <i>Seoul National University, Republic of Korea</i>	Limits of Ground Clutter CLEAN Based Cancelation in Mobile PCL Radar K. Kulpa, M. Baczyk, J. Misiurewicz, M. Malanowski, D. Gromek <i>Warsaw University of Technology, Poland</i>	Comparison of Two Algorithms for Signal Detection in Pulsar-based FSR H. Kabakchiev, V. Behar, I. Garvanov, D. Kabakchieva, A. Kabakchiev et al. <i>Sofia University, Bulgaria</i> <i>Air Traffic Service Authority, Bulgaria</i> <i>University of Twente, the Netherlands</i> <i>INESC-ID, Portugal</i>
10:30 - 11:00 <i>Coffee Break</i>			
10:30 - 11:00 <i>Coffee Break</i>			
10:30 - 11:00 <i>Coffee Break</i>			
	<u>SAAL BEETHOVEN</u>	<u>SAAL SCHUMANN</u>	<u>SAAL REGER</u>
	<u>11:00 - 13:00</u> Automotive Radar 3	<u>11:00 - 13:00</u> Passive Radar 3	<u>11:00 - 13:00</u> Cognitive Radar / Recognition
	Session Chairs: M.-M. Meinecke, Germany M. Gashinova, UK	Session Chairs: T. Brenner, Poland D. Cristallini, Germany	Session Chairs: S. Brüggewirth, Germany J.-F. Degurse, France
11:00	Radar Reflectivity of a Passenger Car at 300 GHz E. Marchetti, L. Daniel, E. G. Hoare, F. Norouzian, M. Cherniakov, M. Gashinova <i>University of Birmingham, UK</i>	Direct Signal Interference Mitigation by Slow-Time Frequency Correction for OFDM-based Passive Radar C. Schüpbach, S. Welschen <i>armasuisse Science + Technology, Switzerland</i> <i>ETH Zurich, Switzerland</i>	Cognitive Radar Principles and Application to Interference Reduction M. Steck, C. Neumann, M. Bockmair <i>Hensoldt Sensors GmbH, Germany</i>
11:20	A Compact Terahertz Source Technology for Automotive Radar and Other Applications A. Al-Khalidi, K. Alharbi, J. Wang, E. Wasige <i>University of Glasgow, UK</i>	An Iterative Algorithm for Passive Detection with Direct-Path Interference X. Zhang, H. Li, B. Himed <i>Stevens Institute of Technology, USA</i> <i>AFRL/RVMD, USA</i>	Mission-based Radar Optimisation via Automated Scenario Recognition R. Thaens, C. Coman <i>NATO Communications and Information Agency, the Netherlands</i>
11:40	Black Box Automotive Radar Characterization M. Brinkmann, S. Heuel <i>Rohde & Schwarz GmbH, Germany</i>	Improved Detection for Passive Radar by Illumination Matching on Reference Channel P. Marques <i>Instituto Superior de Engenharia de Lisboa, Portugal</i>	Ground Moving Radar Targets Classification Based on Spectrogram Images Using Convolutional Neural Networks E. Al Hadhrami, M. Al Mufti, B. Taha, N. Werghi <i>Khalifa University of Science and Technology, United Arab Emirates</i>
12:00	Non-Linearity Effects in PLL Based Automotive Radar Systems F. G. Jansen, F. Laghezza <i>NXP Semiconductors, the Netherlands</i>	2D Localization with WiFi Passive Radar and Device-based Techniques: An Analysis of Target Measurements Accuracy I. Milani, F. Colone, P. Lombardo <i>University of Rome La Sapienza, Italy</i>	Helicopter Main and Tail Rotor Blade Parameter Extraction Using Micro-Doppler S. Prajakta, A. Dyana, K. P. Ray, D. Shashikiran, A. Vengadarajan <i>Defence Institute of Advance Technology, India</i> <i>DRDO, India</i>

12:20	Detection of Vital Signs in Presence of Car Vibrations and Radar-Based Passenger Classification S. Dias Da Cruz, H.-P. Beise, U. Schröder, U.Karahasanovic <i>IEE S.A., Luxembourg</i>	The Influence of Channel Errors in Mobile Passive Radar using DVB-T Illuminators of Opportunity P. Wojaczek, D. Cristallini <i>Fraunhofer FHR, Germany</i> <i>University of Rome, Italy</i>	Radar Environment Experimental Analysis for Optimal Siting G. Galati, G. Pavan <i>Tor Vergata University of Rome, Italy</i>
12:40	Mathematical Modelling and Simulations of Complex Breathing Patterns Detected by RADAR Sensors U. Karahasanovic, T. Stifter, H.-P. Beise, A.Fox, D. Tatarinov <i>IEE S.A., Luxembourg</i>	Target Detection for Passive Bistatic Radar with Direct-Path Interference Y. Zhao, D. Hu, C. Zhao, Y. Zhao, Z. Liu <i>National Digital Switching System Engineering and Technological Research Center, China</i>	The Distributed Radar System for Monitoring the Surrounding Situation for the Intelligent Vehicle A. Myakinkov, S. Shishanov, S.Sidorov, S.Shabalin <i>Nizhny Novgorod State Technical University, Russia</i>
13:00 - 14:00 <i>Lunch</i> 13:00 - 14:00 <i>Lunch</i> 13:00 - 14:00 <i>Lunch</i>			
SAAL BEETHOVEN	SAAL SCHUMANN	SAAL REGER	
14:00	14:00 – 15:40 Forward Scatter Radar Session Chairs: M. Cherniakov, UK R.T. Knoess-Zech, Germany	14:00 - 15:40 Maritime Radar Session Chairs: A. Dzvonkovskaya, Germany R. Wawruch, Poland	14:00 – 15:40 Radar Polarimetry and Meteorology 1 Session Chairs: S. Trömel, Germany Y. Averyanova, Ukraine
14:20	Resilient Multi-Static Forward-Scatter Network For Wide Area Air Traffic Monitoring M. Tolonen, P. Ptak, J. Hartikka, M.Ritola, A.Ludvig, M. Korhonen, T. Kauranne <i>Lappeenranta University of Technology, Finland</i> <i>Oy Arbonaut Ltd, Finland</i>	A Ku-Band Radar with Dual-Polarized Phase Steered Antenna for Maritime Environmental Surveillance R. Norland <i>ISPAS AS, Norway</i>	Characteristics of Convective Organizations in Radar Measurements I. Pscheidt, S. Trömel <i>University of Bonn, Germany</i>
14:40	Multi-static Forward Scatter Radar with Illumination from Telecommunication Satellites for Detection of Airborne Targets V.N.Burov, A.V. Myakinkov, A.G.Ryndyk, R.S.Fadeev, D.M.Balashova, A.B.Blyakhman <i>Nizhny Novgorod State Technical University, Russia</i> <i>Nizhny Novgorod Research Institute of Radio Engineering, Russia</i>	HF Ocean Radar with a Triangle Waveform Implementation A. Dzvonkovskaya, L. Petersen, T. Helzel <i>Helzel Messtechnik GmbH, Germany</i>	Synergy of GPM and Ground-Based Radar Observations for Precipitation Estimation and Detection of Microphysical Processes V. Pejčić, S. Trömel, K. Mühlbauer, P. Saavedra, J. Beer, C. Simmer <i>University of Bonn, Germany</i>
15:00	Sea Clutter Power Reduction in Pulse Forward Scatter Radar M. B. Porfido, M. Martorella, M. Gashinova, M.Cherniakov <i>University of Pisa, Italy</i> <i>University of Birmingham, UK</i>	Tests of the Accuracy of Indications by ARPA and AIS of the Opposite Vessel True Course, True Speed and CPA R. Wawruch <i>Gdynia Maritime University, Poland</i>	Effects of a Gamma DSD with Variable Shape Parameter on Polarimetric Radar Moments K. Schinagl, C. Rieger, C. Simmer, S.Trömel, P.Friederichs <i>University of Bonn, Germany</i>
15:20	Kinematic Parameters Extraction from a Single Node Forward Scatter Radar Configuration N. Ustalli, D. Pastina P. Lombardo <i>Sapienza University of Rome, Italy</i>	A Stochastic Model for the Generation of Correlated Sea Clutter D. Luber, U. Siart <i>IABG mbH, Germany</i> <i>Technical University of Munich, Germany</i>	Challenges Regarding the Calibration of Polarimetric X-Band Weather Radars at the Core Facility of the Jülich Observatory for Cloud Evolution J. Beer, S. Trömel <i>University of Bonn, Germany</i>
15:40	Separation of Pulsar Signals in FSR System H. Kabakchiev, V. Behar, I. Garvanov, D.Kabakchieva, A. Kabakchiev et al. <i>Sofia University, Bulgaria</i> <i>Air Traffic Service Authority, Bulgaria</i> <i>University of Twente, the Netherlands</i>	Synthesis of Detection Algorithm for Harmonic Signal and Second-Order Autoregressive Sea Clutter Model I. Prokopenko, V. Vovk, K. Prokopenko <i>National Aviation University, Ukraine</i>	Simulations of Multi Polarization Measurements and Reflected Signal Magnitude Variations Caused by Turbulence Y. Averyanova, A. Rudiakova, I. Braun, F.Yanovsky <i>National Aviation University, Ukraine</i>
15:40 - 16:10 <i>Coffee Break</i> 15:40 - 16:10 <i>Coffee Break</i> 15:40 - 16:10 <i>Coffee Break</i>			
SAAL BEETHOVEN	SAAL SCHUMANN	SAAL REGER	
16:10	16:10 - 17:30 Radar and Data Science 1 Session Chairs: F. Opitz, Germany A. McDonald, South Africa	16:10 - 17:30 Radar Subsystems Session Chairs: H. Hommel, Germany P. Ziegler, Switzerland	16:10 - 17:30 Radar Polarimetry and Meteorology 2 Session Chairs: C. Simmer, Germany J. Vesely, Czech Republic
16:10	Machine Learning Techniques for Enhancing Maritime Surveillance Based on GMTI Radar and AIS	Decoupling Evaluation of Compact Phased Array Radars M. Pralon, L. Pralon, B. Pompeo, G.Beltrao, T.Pasetto, R. Thomä	Dual-Doppler and Polarimetric Radar Analysis of Hail Events in Germany R. Evaristo, S. Trömel, C. Simmer <i>University of Bonn, Germany</i>

<p>16:30</p> <p>16:50</p> <p>17:10</p>	<p>K. Dästner, B. von Haßler zu Roseneck-Köhler, F. Opitz, M. Rottmaier, E. Schmid <i>Airbus Defence and Space, Germany</i></p> <p>Ship Classification Based on Trajectory Data with Machine-Learning Methods P. Kraus, C. Mohrdieck, F. Schwenker <i>Airbus Defence and Space, Germany</i> <i>Ulm University, Germany</i></p> <p>Accurate and Efficient Performance Prediction for Non-Coherent Detection of Targets in Correlated K-Distributed Sea Clutter and AWGN A. M. McDonald, J.E. Cilliers, M.A. van Wyk <i>Council for Scientific and Industrial Research, South Africa</i> <i>University of the Witwatersrand, South Africa</i></p> <p>Radar Site Studies with Automated Propagation Effect Calculations Using QSiteAnalysis T. Drey, J. Urban <i>Airbus Defence and Space, Germany</i></p>	<p><i>Brazilian Army Technology Center, Brazil</i> <i>University of Campinas, Brazil</i> <i>Ilmenau University of Technology, Germany</i></p> <p>Effect of Beam Pattern and Amplifier Gain of Repeater-type Active Decoy on Jamming to Active RF Seeker System based on Proportional Navigation Law J.-W. Rim, I.-S. Koh <i>Inha University, Republic of Korea</i></p> <p>Realization of the Functional Model of the Software Radar Receiver D. Ivković, M. Andrić, B. Zrnić, A. Cajković, L.Mitrović <i>Military Technical Institute, Serbia</i> <i>University of Defence, Serbia</i> <i>UNO-LUX NS, Serbia</i></p>	<p>Severe Hail Detection: Hydrometeor Classification for Polarimetric C-band Radars Using Fuzzy-Logic and T-matrix Scattering Simulations M. Schmidt, S. Trömel, A. V. Ryzhkov, C.Simmer <i>University of Bonn, Germany</i> <i>University of Oklahoma, USA</i></p> <p>Polarimetric Radar Observations Meet Atmospheric Modelling S. Trömel, J. Quaas, S. Crewell, A.Bott, C.Simmer <i>University of Bonn, Germany</i> <i>University of Leipzig, Germany</i> <i>University of Cologne, Germany</i></p> <p>Optimization and Improvement of Atmospheric Pressure 3D Map Creation with Use of Passive Radar Data L. Gregor, J. Vesely <i>University of Defence, Czech Republic</i></p>
---	--	--	---

19:00 – 22:00

CHRISTIAN HÜLSMEYER AWARD CEREMONY & SYMPOSIUM DINNER

Saal MARITIM, Maritim Hotel

Friday, June 22, 2018

FOYER

08:30 - 14:00 Exhibition

	SAAL BEETHOVEN	SAAL SCHUMANN	SAAL REGER
	08:30 - 10:10 Radar and Data Science 2	08:30 - 10:10 Radar Systems	08:30 – 10:10 SAR Techniques and Applications
	Session Chairs: F. Barbaresco, France K. Dästner, Germany	Session Chairs: W. Manz, Germany Y. Watanabe, Japan	Session Chairs: H. Anglberger, Germany V. Stejskal, Czech Republic
08:30	Radar Micro-Doppler Signal Encoding in Siegel Unit Poly-Disk for Machine Learning in Fisher Metric Space F. Barbaresco <i>Thales Land & Air Systems, France</i>	Over-The-Horizon Radar (OTHR) in Canada T. Thayaparan, Y. Ibrahim, J. Polak, R.Riddolls <i>Defence Research and Development Canada</i> <i>University of Waterloo, Canada</i> <i>Queen's University, Canada</i>	DI2S Technique for a C-Band SAR System D. Calabrese, S. Federici, A. Perrera, D.Rizzato <i>Thales Alenia Space, Italy</i>
08:50	Temporal Deep Learning for Drone Micro-Doppler Classification D. Brooks, O. Schwander, F. Barbaresco, J.-Y. Schneider, M. Cord <i>Thales Air Systems, France</i> <i>Sorbonne University, France</i>	Sparse Random SAR Trajectories for a Millimeter Wave 3D Radar Scanner J. Rama, R. Herschel, W. Heinrich <i>Fraunhofer FHR, Germany</i> <i>Leibniz-Institut für Höchstfrequenztechnik, Germany</i>	Detection of Aircraft Using Sentinel-1 SAR Image Series M. Dostovalov, R. Ermakov, T. Moussiniant <i>Research Institute of Precise Instruments, Russia</i>
09:10	Reduction Methods For Accelerating Optimization of Radar Search Patterns Y. Briheche, F. Barbaresco <i>Thales Research & Technology, France</i> <i>Thales Air Systems, France</i>	Modified Cherry-Hooper Amplifier for UWB Applications in 0.35 µm SiGe BiCMOS Technology M. Sokol, P. Galajda, S. Slovak, M.Pečovský <i>Technical University of Košice, Slovak Republic</i>	A Deep Learning SAR Target Classification Experiment on MSTAR Dataset C. Coman, R. Thaens <i>NATO Communications and Information Agency, the Netherlands</i>
09:30	Assessing Multiple-Target Tracking Performance of GNN Association Algorithm P. Kulmon, P. Stukovska <i>Czech Technical University in Prague, Czech Republic</i> <i>ERA a.s., Czech Republic</i>	Implementation of Delay Line with Fine Range Discretization for Radar Target Simulations M. Steins, A. R. Diewald <i>Trier University of Applied Sciences, Germany</i>	Beam-Space Based MIMO SAR Digital Beamforming with Array-Fed Reflector Antennas Y. Sun, F. He, S. Zhou, F. Li, Z. Tan <i>National University of Defense Technology, China</i>

09:50	Target Classification Using Kinematic Data and a Recurrent Neural Network S. Bækkegaard, J. Blixenkronne-Møller, J.J.Larsen, L. Jochumsen <i>Aarhus University, Denmark</i> <i>Terma, Denmark</i>		An Improved Estimator of Faraday Rotation in Linearly Polarized SAR Data J. Li, Y. Ji, Y. Zhang, Q. Zhang, H. Huang, Z.Dong <i>National University of Defense Technology, China</i>
	10:10 - 10:40 <i>Coffee Break</i>	10:10 - 10:40 <i>Coffee Break</i>	10:10 - 10:40 <i>Coffee Break</i>
	SAAL BEETHOVEN	SAAL SCHUMANN	SAAL REGER
10:40	10:40 - 12:40 Passive Radar Imaging / Recognition Session Chairs: P. Samczynski, Poland F. Berizzi, Italy	10:40 - 12:40 MIMO Radar / Beamforming Session Chairs: J. Sachs, Germany J. Misiurewicz, Poland	10:40 - 12:40 UWB Radar Session Chairs: K. Lukin, Ukraine B. Levitas, Lithuania
11:00	Passive Aperture Synthesis Using Pulsar's Emissions A. Lazarov, C. Kabakchiev, C. Minchev, I.Garvanov <i>Burgas Free University, Bulgaria</i> <i>Sofia University, Bulgaria</i> <i>Shumen University, Bulgaria</i>	Imaging Characteristics of a Highly Integrated Millimeter Wave MIMO Radar S. Kueppers, S. Wang, H. Cetinkaya, R.Herschel, N. Pohl <i>Fraunhofer FHR, Germany</i> <i>Ruhr University Bochum, Germany</i>	Experimental Analysis of UWB OFDM Software-Defined Radar Performance for Ad-Hoc Networked Systems N. Conduct, D. Garmatyuk, S. Mudaliar <i>Miami University, USA</i> <i>Air Force Research Laboratory, USA</i>
11:20	Passive GNSS-based Multistatic SAR: First Experimental Results U. Nithirochananont, M. Antoniou, M.Cherniakov <i>University of Birmingham, UK</i>	Using Golay Sequences To Improve The Range Performance of Hybrid Codes for MIMO Radar M. I. Schöpe, H. Driessen, A. Yarovoy <i>Delft University of Technology, the Netherlands</i>	Comparison of Impulse and M-sequence Radar Systems for Measurement of Relative Permittivity M. Repko, J. Gamec <i>Technical University of Košice, Slovakia</i>
11:40	Doppler Beam Sharpening in Passive Bistatic Radar with Spaceborne Illuminators of Opportunity J.P. Rowlatt, S. Hristov, L. Daniel, M.S.Gashinova A.G. Stove, M. Cherniakov <i>University of Birmingham, UK</i>	Synchronization of Long-Range, Widely-Separated MIMO Radar Network using GSM Protocol F. A. Butt, M.A. Aslam, M. T. Zafar, I. H. Naqvi, U. Riaz <i>Lahore University of Management Sciences, Pakistan</i> <i>Air University, Pakistan</i>	RF-IV Impedance Measurement Method by an M-sequence UWB Radar M. Pečovský, P. Galajda, S. Slovak, M.Sokol <i>Technical University of Košice, Slovakia</i>
12:00	Wideband Multistatic Passive Radar Demonstrator for ISAR Imaging Using COTS Components M. K. Bączyk, B. Dzikowski, P.Samczyński, K.Kulpa <i>Warsaw University of Technology, Poland</i>	Eight Channel Digital Beamforming Radar for Academic Lab Courses and Research L. Dirksmeyer, A.R. Diewald, S. Müller <i>Trier University of Applied Sciences, Germany</i>	Robot Gripper Movement Accuracy Estimation by Using UWB Radar S. Slovak, P. Galajda, M. Pečovský, M. Sokol, M.Švecova <i>Technical University of Košice, Slovakia</i>
12:20	Recognition of Propeller-Driven Aerial Targets in DVB-T2 Passive Bistatic Radar E. Vorobev, V. Veremyev, V. Kutuzov <i>Saint Petersburg Electrotechnical University, Russia</i>	Maneuver Detector for Active Tracking Update Rate Adaptation M. Pilte, S. Bonnabel, F. Barbaresco <i>Mines ParisTech, France</i> <i>Thales Air Systems, France</i>	Stepped Frequency Software Defined Radar for Through Wall Detection B. Levitas, M. Drozdov, I. Naidionova, K. Kiela, Ž. Tamoševičius, A. Mamaev <i>Geozondas, Lithuania</i> <i>Vilnius Gediminas Technical University, Lithuania</i> <i>Lime Microsystems, Lithuania</i>
	12:40 - 13:40 <i>Lunch</i>	12:40 - 13:40 <i>Lunch</i>	12:40 - 13:40 <i>Lunch</i>
	SAAL BEETHOVEN	SAAL SCHUMANN	SAAL REGER
13:40	13:40 - 15:00 GNSS-based Radar Session Chairs: H. Kabakchiev, Bulgaria A. Myakinkov, Russia	13:40 - 15:00 Signal Processing Session Chairs: D. Nagel, Germany A. Witczak, Poland	13:40 - 15:00 Detection/Estimation Session Chairs: A. Kawalec, Poland T. Long, China
	First Approach to Motion Compensation Considerations for Passive Radar System Based on GPS Signals J.L. Bårceña-Humanes, P.J. Gómez-del-Hoyo, M.P. Jarabo-Amores, J. Rosado-Sanz, M.C.Benito-Ortiz <i>University of Alcalá, Spain</i>	Radar Signal Processing with OpenCL on Integrated Graphic Processors M. Bantle, P. Bayerl, S. Funken, M. Thoma <i>Hensoldt Sensors GmbH, Germany</i> <i>University of Ulm, Germany</i>	Occlusion Handling in Radar for Detection of Obstacles Based on Tracking Model S. Segal, A. Logvinenko, A. Slapak <i>RodRadar, Israel</i>

<u>14:00</u>	Extent of Observation Parameters in Space Surveillance by Radar R. Kohlleppe <i>Fraunhofer FHR, Germany</i>	On the Use of GPGPU Computing for Space-Time Adaptive Processing on Airborne Systems J.-F. Degurse, S. Kemkemia <i>THALES Airborne Systems, France</i>	A Miss-Detection Probability Based Thresholding Algorithm for an IR-UWB Radar Sensor X. Quan, J. W. Choi, S. H. Cho <i>Hanyang University, Republic of Korea</i>
<u>14:20</u>	Observation of Falling Cosmic Objects Using GPS-Based FSR H. Kabakchiev, V. Behar, I. Garvanov, D.Kabakchieva, K. Kabakchiev et al. <i>Sofia University, Bulgaria Institute of Information and Communication Technologies, Bulgaria</i>	Target Detection Using Optimal Load Matching and Interference Nulling Y. Parshin, M. Grachev <i>Ryazan State Radio Engineering University, Russia</i>	Indoor Positioning and Body Direction Measurement System Using IR-UWB Radar D. Yim, S. H. Cho <i>Hanyang University, Republic of Korea</i>
<u>14:40</u>	Comparative Analysis of Two GPS Forward Scattering Systems For Cars Parameter Estimation H. Kabakchiev, V. Behar, I. Garvanov, D.Kabakchieva, A. Kabakchiev et al. <i>Sofia University, Bulgaria University of Library Studies and Information Technologies, Bulgaria</i>	Adaptive Performance of Quasi-Optimal Inter-Period Processing Systems A. V. Semeniaka, D.I. Lekhovytskyi, D.V.Atamanskiy <i>Scientific Research Institute of Radar Systems, Ukraine Air Force University, Ukraine</i>	A Novel Interpolation Method for TDOA and FDOA Estimation based on Second-order Cone Programming Z. Liu, D. Hu, Y. Zhao, Y. Zhao <i>National Digital Switching System Engineering and Technological Research Center, China</i>
<p><u>15:10</u> <u>CLOSING SESSION</u></p> <p>IRS 2018 BEST PAPER AWARD Closing Remarks</p>			
<p><u>16:00</u> <u>SYMPOSIUM IS CLOSED</u></p>			