Final Programme

Organizers: The Institution of Engineering and Technology
Chinese Institute of Electronics
Beijing Institute of Technology
Co-organizers: Xidian University
Aviation Key Laboratory of Science and Technology on AISSS
Technical co-sponsor: IEEE Geoscience and Remote Sensing Society
Sponsors: Beijing Racohit Electronic Information Technology Co., Ltd.
Science and Technology on Space Microwave Laboratory, CAST
Beijing Institute of Radio Measurement
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Welcome Message from General Chair

On behalf of the Organizing Committee, I would like to extend my very best wishes for the success of IET International Radar Conference 2013 and I welcome all of you to Xian.

IET International Radar Conference 2013 is the second conference after the first one which was successfully held on April 2009 in Guilin, China. The aims of the conference are to introduce the latest technological development and academic research hot spots of the radar technology, especially the latest research achievements and applications of civilian radar technology. It will provide a communication platform for domestic and foreign radar experts and technicians.

This conference is jointly organized by the Institution of Engineering and Technology, Chinese Institute of Electronics, and Beijing Institute of Technology, we also got strong support from Aviation Key Laboratory of Science and Technology on AISSS, Xidian University, IEEE Geosciences and Remote Sensing Society, IEEE Antennas and Propagation Society and National Natural Science Foundation of China. At the meantime, I would like to express my appreciation to the sponsors of IET Radar 2013 which include National Natural Science Foundation of China, Beijing Institute of Electronics, Science China Information Sciences, National Key Laboratory of Microwave Imaging Technology, National Key Laboratory of Automatic Target Recognition, National Key Laboratory of Radar Signal Processing, Science and Technology on Space Microwave Laboratory, CAST and Beijing Radartech Electronic Information Technology. Moreover, my sincere appreciation goes to all authors including those whose papers were not accepted. Many thanks to our keynote speakers for their valuable contribution to the conference, special thanks to our technical program chairs for assembling an absolutely outstanding technical program committee that reviewed and selected papers for the final program.

Finally, I hope all of you enjoy IET Radar 2013 and find this a productive opportunity to learn, exchange ideas, make new contacts and renew old ones.

Prof. Zeng Tao,
General Chairman of IET Radar 2013
Beijing Institute of Technology
Welcome Message from Technical Program Chair

IET Radar Conference 2013 is IET’s second radar showcase event in China. As the radar technology grows in China, research and industry is becoming active in showcasing their work and publishing new results in high quality forums not only to increase their profile and ranking in the global market but also to provide an international platform.

The overwhelming response to our call-for-papers indicates the popularity of this conference, and the enthusiasm from all aspects of science and technology of radar field has certainly increased due to the successful launches of latest technological development and academic research hot spots of radar technology, especially the latest research achievements and applications of civilian radar technology.

This conference has received a total of 765 papers from 20 countries and regions. All submitted papers went through a rigorous review process, and 90 papers were selected for oral presentation and 360 papers will be displayed for interactive poster presentations, resulting in an accepted rate of 58.8%. The selected papers cover a wide range of Radar System, SAR and ISAR, Radar Information Processing Techniques, Civilian Radar, Radar Environment and Phenomenology and Advanced Antenna Techniques, etc. This conference is honored to feature 8 keynote speeches and 5 tutorials from distinguished experts which will share with us their latest research result and their insight to the future radar development.

I’d like to take this opportunity to send my appreciation to all technical program committees for their hard work and contribution to this conference. Also, appreciate all authors including those whose papers were not accepted.

I wish IET International Radar Conference 2013 a great success and look forward to seeing you in Xian.

Dr. Xiaopeng Yang
Technical Program Chair of IET Radar 2013
Beijing Institute of Technology
Organizations

Organizers:
The Institution of Engineering and Technology
Chinese Institute of Electronics
Beijing Institute of Technology

Co-organizers:
Xidian University
Aviation Key Laboratory of Science and Technology on AISSSS

Technical co-sponsor:
IEEE Geoscience and Remote Sensing Society

Supporters:
National Natural Science Foundation of China
Beijing Institute of Electronics
Science China Information Sciences
National Laboratory of Microwave Imaging Technology
National Laboratory of Automatic Target Recognition
National Laboratory of Radar Signal Processing
Science and Technology on Space Microwave Laboratory, CAST

Sponsors:
Beijing Racobit Electronic Information Technology Co., Ltd.
Beijing Institute of Radio Measurement
Committee

Honorary Chairs:
Prof. Andy Hopper, President of IET, University of Cambridge, UK
Prof. Erke Mao, Academician of Chinese Academy of Engineering, China
Prof. Teng Long, Beijing Institute of Technology, China

General Chair:
Prof. Tao Zeng, Beijing Institute of Technology, China

General Co-Chairs:
Prof. Hugh Griffiths, President of IEEE AESS, University College London, UK
Prof. François Le Chevalier, Thales Air Operations, France
Prof. Tapan K. Sarkar, Syracuse University, USA
Prof. Jianqi Wu, East China Research Institute of Electronic Engineering, China
Prof. Hongwei Liu, Xidian University, China

Technical Program Chair:
Dr. Xiaopeng Yang, Beijing Institute of Technology, China

Technical Program Co-Chairs:
Prof. Wen Hong, Chinese Academy of Sciences, China

Technical Program Committee:
Dr. Michail Antoniou, University of Birmingham, UK
Dr. Khalil Al-Manassir, University of Nottingham-Ningbo, China
Dr. Qinglong Bao, National University of Defense Technology, China
Dr. Hao Chen, Natural Resources Canada, Canada
Prof. Qiang Chen, Tohoku University, Japan
Dr. Wanzhao Cui, Science and Technology on Space Microwave Laboratory, CAST, China
Dr. Zegang Ding, Beijing Institute of Technology, China
Dr. Xiongjun Fu, Beijing Institute of Technology, China
Dr. Derek Gray, University of Nottingham-Ningbo, China
Dr. Yunfei Guo, Hangzhou Dianzi University, China
Dr. Mang He, Beijing Institute of Technology, China
Dr. Cheng Hu, Beijing Institute of Technology, China
Dr. Julien Le Kernec, University of Nottingham-Ningbo, China
Prof. Jinhwan Koh, GyeongSang National University, Korea
Dr. Hai Li, Civil Aviation University of China, China
Dr. Quanhua Liu, Beijing Institute of Technology, China
Dr. Yong Liu, Beijing Institute of Technology, China
Dr. Yumin Lu, NXP Semiconductors, USA
Dr. Huadong Meng, Tsinghua University, China
Prof. Haihong Tao, Xidian University, China
Dr. Sio Weng Ting, University of Macau, Macao, China
Dr. Hongyu Wang, Beijing Institute of Technology, China
Prof. Yanping Wang, Chinese Academy of Sciences, China
Dr. Liangbin Wu, AVIC Radar and Avionics Institute, China
Prof. Jia Xu, Beijing Institute of Technology, China
Dr. Shiyou Xu, National University of Defense Technology, China
Prof. Zhengqing Yun, University of Hawaii at Manoa, USA
Dr. Shunseng Zhang, University of Electronic Science and Technology of China, China
Prof. Yu Zhang, Xidian University, China
Dr. Weijiang Zhao, Institute of High Performance Computing, Singapore
Dr. Gongjian Zhou, Harbin Institute of Technology, China

International Advisory Committee:
Prof. Moeness Amin, Villanova University, USA
Prof. Valeriy M. Bezruk, Kharkiv National University of Radio Electronics, Ukraine
Prof. Rick S. Blum, Lehigh University, USA
Prof. Mihai Datcu, German Aerospace Center DLR, Germany
Prof. Alfonso Farina, SELEX-Sistemi Integrati, Rome, Italy
Prof. David G. Goodenough, Natural Resources Canada, Canada
Prof. Maria Sabrina Greco, University of Pisa, Italy
Prof. Stephen Hobbs, Cranfield University, UK
Dr. Alan Jenkins, Autoliv, Germany
Prof. Grigory I. Khlopov, IRE of National Academy of Sciences of Ukraine, Ukraine
Prof. Hongbin Li, Stevens Institute of Technology, USA
Prof. Leo P. Ligthart, Delft University of Technology, Netherlands
Prof. Qing Huo Liu, Duke University, USA
Prof. Yilong Lu, Nanyang Technological University, Singapore
Prof. Panos Papamichalis, Southern Methodist University, USA
Prof. Magdalena Salazar Palma, Universidad Carlos III de Madrid, Spain
Prof. Motoyuki Sato, Tohoku University, Japan
Prof. Peter Willett, University of Connecticut, USA
Prof. Shunjun Wu, Xidian University, China
Prof. Yimin D. Zhang, Villanova University, USA
# Program Schedule at a Glance

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Content</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 14</td>
<td>09:00-19:30</td>
<td>Registration</td>
<td>Hotel Lobby</td>
</tr>
<tr>
<td>Sunday</td>
<td>15:00-17:30</td>
<td>Tutorial 1: Prof. David G. Goodenough: Forest Applications with Satellite and Airborne Radar</td>
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<tr>
<td></td>
<td>17:30-19:30</td>
<td>Dinner</td>
<td>Western restaurant</td>
</tr>
<tr>
<td></td>
<td>19:30-22:00</td>
<td>Tutorial 2: Prof. Mihai Datcu: Methods and Algorithms for Understanding of High Resolution SAR Images: Towards a SARINT Concept</td>
<td>VIP room</td>
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<tr>
<td></td>
<td>Tutorial 3</td>
<td>Prof. Motoyuki Sato: Ground Penetrating Radar (GPR) / UWB Radar: Fundamentals to applications</td>
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<tr>
<td></td>
<td>08:00-8:20</td>
<td>Opening Ceremony</td>
<td>Banquet hall</td>
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<tr>
<td></td>
<td>08:20-9:10</td>
<td>Plenary Talk 1: Prof. François Le Chevalier: Wide Band - Wide Beam Motion Sensing</td>
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<tr>
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<td>09:10-10:00</td>
<td>Plenary Talk 2: Prof. Tao Zeng: Bistatic SAR: State of the Art and Development Trend</td>
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<tr>
<td></td>
<td>10:00-10:20</td>
<td>Tea/Coffee break</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; floor</td>
</tr>
<tr>
<td></td>
<td>11:10-12:00</td>
<td>Plenary Talk 4: Prof. Hugh Griffiths: The Challenge of Waveform Diversity</td>
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<tr>
<td></td>
<td>12:00-13:30</td>
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<td>Western restaurant</td>
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<tr>
<td></td>
<td>13:30-15:30</td>
<td>Oral Session 1: Special Session on Bistatic SAR</td>
<td>VIP room</td>
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<tr>
<td></td>
<td>Oral Session 2</td>
<td>Target Characteristics and Recognition</td>
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<td></td>
<td>Oral Session 3</td>
<td>Radar Application</td>
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<td>Oral Session 4</td>
<td>Signal Processing</td>
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<td>Poster Session 1</td>
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<td>Poster Session 2</td>
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<td>16:30-18:30</td>
<td>Oral Session 5: Special Session on GEO SAR/InSAR</td>
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<td>Session/Activity</td>
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<tr>
<td>18:30-19:30</td>
<td>Oral Session 7</td>
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<tr>
<td>19:30-22:00</td>
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<tr>
<td>08:00-10:00</td>
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<tr>
<td>10:00-12:00</td>
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<td>10:00-12:00</td>
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<td>14:00-15:00</td>
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<td>14:30-15:30</td>
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<td>08:00-10:00</td>
<td>Oral Session 18</td>
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<tr>
<td>10:00-12:00</td>
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<td>10:00-12:00</td>
<td>Tutorial 9</td>
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<td>16:00-17:00</td>
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<td>Oral Session 41</td>
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<tr>
<td>19:30-22:00</td>
<td>Dinner</td>
<td>Western restaurant</td>
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</tr>
</tbody>
</table>

April 16: Tuesday

Hotel Lobby/酒店大堂: 1st floor of hotel
VIP room/首长接见厅: 5th floor of hotel
Western restaurant/西餐厅: 1st floor of hotel
Chinese restaurant/中餐厅: 2nd floor of hotel
### Oral Sessions at a Glance

**13:30—15:30, April 15, 2013 (Monday)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 1</th>
<th>Session 2</th>
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<tr>
<td>13:30-13:50</td>
<td>B0315</td>
<td>C0625</td>
<td>E0512</td>
<td>D0264</td>
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<td>13:50-14:10</td>
<td>B0557</td>
<td>D0225</td>
<td>A0596</td>
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<td>14:10-14:30</td>
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<td>D0412</td>
<td>C0643</td>
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<td>14:30-14:50</td>
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<td>D0578</td>
<td>C0298</td>
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<td>A0633</td>
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**16:30—18:30, April 15, 2013 (Monday)**

<table>
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<td>D0343</td>
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**08:00-10:00, April 16, 2013 (Tuesday)**

<table>
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<tr>
<th>Time</th>
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<th>Session 10</th>
<th>Session 11</th>
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**10:20-12:00, April 16, 2013 (Tuesday)**

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## Poster Sessions at a Glance

### Poster Session 1  
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**Place:** Corridor of 3rd floor

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Plenary Talks

Title: Wide Band - Wide Beam Motion Sensing
Speaker: Prof. François LE CHEVALIER, Thales Air Operations, France
Date: 08:20-9:10, April 15, 2013, Place: Banquet hall

Abstract: The instantaneous bandwidth is a critical radar parameter, with direct influence on the performances, but also on the cost – this being especially true for active antenna systems, where multiple channels reception is generally implemented for taking full advantage of the flexibility. It is therefore important to consolidate an overall view of the expected benefits of an increased bandwidth, taking into account all possible effects. In this keynote speech, we will analyze the relations between range, Doppler, and angle, including simultaneous transmissions, or colocated MIMO, for detection and location of moving targets. The idea is to contribute to a better understanding of the benefits of widening the bandwidth for detection of moving targets, focusing not only on waveform aspects, but also on the velocity and angular measurement consequences. Wideband Waveforms: unambiguous detection and location of moving targets: Widening the bandwidth of radar has significant influence on moving targets characteristics, as soon as fluctuating targets, and clutter limitations are considered. The global effect on clutter reduction is well-understood – decrease of clutter RCS, increase of fluctuations – but a reliable model for difficult situations are still missing. Taking into account target fluctuations has also been considered for many decades, but the consequences on detection performances are still debated: a simple model will be proposed in this keynote speech for radar design purposes. Another consequence of range resolution improvement is less generally acknowledged – and might provide wider benefits: the removal of Doppler ambiguities (and associated blind velocities) for low prf radars: recent results for wideband clutter cancellation will be presented in this talk, and their consequences on system aspects (e.g. velocity resolution) will be outlined. Finally, it will be shown that widening the bandwidth also improves the angular discrimination of extended targets – a significant gain when threat evaluation is required, and the associated performance will be estimated. Space-time coding: simultaneous transmissions for wide instantaneous angular coverage: The basic trade-offs governing focused beam and wide beam digital beamforming for multichannel coherent receiving systems are now well established, especially regarding the relation with Doppler resolution and ensuing clutter suppression. Taking also into account the possibility of simultaneous multiple transmissions make the problem more complex, since more degrees of freedom are available, but also provide significant benefits. The exact added value, however, is not easily defined, and requires analysis of 3D ambiguity functions, for clarification of the existing trade-offs between spectral bandwidth occupancy and clutter cancellation, for different classes of space-time radar waveforms appropriate for specific operational scenarios. Space-time waveform generation and coding will then be presented in detail, and illustrated with different basic examples.
attention will be given to analyzing the consequences of space-time coding (fast-time or slow-time) on Doppler-range-angle performances, for different airborne and surface-based applications. Taking into account the previous analysis of wideband waveforms, specific properties of wideband space-time waveforms will then be identified, with special attention to ambiguities and to clutter cancellation. This analysis will aim at identifying the additional benefits for small targets extraction, separation and classification in adverse environments, and estimating the cost of such added benefits. Conclusion: Due to their wide range of operational and technical advantages, active antenna systems are now becoming a standard for high performance radar systems. However, this talk will show that widened bandwidths are also key to operational performance improvement: new architectures can be designed for future radar systems, where modern front-end capabilities taking full benefit from the available agility and diversity – through optimized signal generation and processing techniques – to improve detection of targets and threat analysis in difficult environments.

Biography: François Le Chevalier is in charge of the Chair “Radar Systems Engineering” at Delft University of Technology (The Netherlands), and Scientific Director of Thales Air Operations Division in Rungis (94), France. Mr. Le Chevalier began his career at the Office National d’Etudes et de Recherches Aérospatiales (Onera), where he initiated research on radar target and background signatures processing. In 1986, Mr. Le Chevalier joined Thomson-CSF (now Thales), where he pioneered French developments in adaptive digital beamforming and STAP radar systems demonstrations, and shared apertures and multisensor concepts design and validation. In 1998, he joined the Airborne Systems group, as Scientific Director, in charge of advanced research and developments coordination (airborne radars, electronic warfare, airborne mission systems). His current research activities include space-time coding for active antenna systems, and wideband unambiguous radar systems. He has been active in- or chairing- the Technical Program Committees of most IEEE International Radar Conferences since Brest, 1999, has recently chaired the Technical Program Committee of EURAD 2012, Amsterdam, and will be the honorary Chair of SEE/IEEE International Radar Conference in France, 2014. An author of many papers, tutorials, and patents in radar and electronic warfare, Prof. Le Chevalier, an Emerite member of the Société des Electriciens et des Electroniciens (SEE), is the author of a book on “Radar and Sonar Signal Processing Principles” published by Artech House in 2002, editor of “Non-Standard Antennas”, published by Wiley in 2010, and co-author of “Principles of Modern Radar: Advanced Techniques”, published by Seitech, IET Publishing, 2012.
Title: Bistatic SAR: State of the Art and Development Trend  
Speaker: Prof. Tao Zeng, Beijing Institute of Technology, China  
Date: 09:10-10:00, April 15, 2013, Place: Banquet hall

Abstract: Bistatic SAR (BiSAR) systems have attracted the interests from global researchers and become a hotspot in the international radar community due to the progress of radar technology and rapidly increased applications nowadays. Based on the BiSAR experiments and breakthrough of the key technology, the general progresses of BiSAR systems will be summarized, especially in European radar community, from different aspects such as system design, processing idea and topology etc. Different bistatic image formation algorithms will be analyzed and reviewed. Furthermore, the principle of bistatic Interferometry based on opportunity illumination will be introduced, and the processed results of bistatic Interferometry will be shown in detail.

Biography: Zeng Tao received his bachelor’s degree and Ph.D. degree in 1994 and 1999 respectively, from the Department of electronic engineering, Beijing Institute of Technology, China. He was the chairman of IET International Radar conference 2013, and the program chairman of IET International Radar conference 2009. He joined the teaching staff in Beijing Institute of Technology in 1999. During 2002 to 2003, he visited the Department of Electronic Engineering, University of Birmingham, UK. During 2013.01 to 2013.02, he visited the Department of Electronic Engineering, University of California at Los Angeles. His main research interests include Bistatic SAR signal processing, Mini SAR system, SAR simulation and so on. He was in charge of several state projects, and published more than 80 papers (more than 20 journal papers), and authorized more than 20 patents.

Title: Interpolation/Extrapolation of Radar Cross-Section (RCS) Data in the Frequency Domain Using the Cauchy Method  
Speaker: Prof. Tapan K. Sarkar, Syracuse University, USA  
Date: 10:20-11:10, April 15, 2013, Place: Banquet hall

Abstract: The Cauchy method to applied to interpolate/extrapolate the radar cross-section (RCS) data which is amplitude-only data over a given frequency band. This is accomplished by approximating the amplitude-only data by a ratio of two polynomials, the coefficients of which are calculated by using the total least squares (TLS) implementation of a singular value decomposition (SVD) technique so as to properly estimate the dimension of the null space. By applying the Cauchy method, the power spectrum of an electromagnetic system is represented by a set of symmetric pole and zero pairs in the -plane. Once these coefficients in the numerator and the denominator polynomials in the Cauchy method are computed using the amplitude-only data,
the response can be interpolated/extrapolated over other frequencies of interest. Numerical examples are presented to illustrate the applicability of the Cauchy method in interpolating/extrapolating RCS data over a frequency band, including a method of generating the phase response from the amplitude-only data.

**Biography:** Tapan K. Sarkar received the B.Tech. degree from the Indian Institute of Technology, Kharagpur, in 1969, the M.Sc.E. degree from the University of New Brunswick, Fredericton, NB, Canada, in 1971, and the M.S. and Ph.D. degrees from Syracuse University, Syracuse, NY, in 1975. From 1975 to 1976, he was with the TACO Division of the General Instruments Corporation. He was with the Rochester Institute of Technology, Rochester, NY, from 1976 to 1985. He was a Research Fellow at the Gordon McKay Laboratory, Harvard University, Cambridge, MA, from 1977 to 1978. He is now a Professor in the Department of Electrical and Computer Engineering, Syracuse University. His current research interests deal with numerical solutions of operator equations arising in electromagnetics and signal processing with application to system design. He obtained one of the “best solution” awards in May 1977 at the Rome Air Development Center (RADC) Spectral Estimation Workshop. He received the Best Paper Award of the IEEE Transactions on Electromagnetic Compatibility in 1979 and in the 1997 National Radar Conference. He has authored or coauthored more than 300 journal articles and numerous conference papers and 32 chapters in books and fifteen books, including his most recent ones, Iterative and Self Adaptive Finite-Elements in Electromagnetic Modeling (Boston, MA: Artech House, 1998), Wavelet Applications in Electromagnetics and Signal Processing (Boston, MA: Artech House, 2002), Smart Antennas (IEEE Press and John Wiley & Sons, 2003), History of Wireless (IEEE Press and John Wiley & Sons, 2005), and Physics of Multiantenna Systems and Broadband Adaptive Processing (John Wiley & Sons, 2007), Parallel Solution of Integral Equation-Based EM Problems in the Frequency Domain (IEEE Press and John Wiley & Sons, 2009), and Time and Frequency Domain Solutions of EM Problems using Integral Equations and a Hybrid Methodology (IEEE Press and John Wiley & Sons, 2010). Dr. Sarkar is a Registered Professional Engineer in the State of New York. He received the College of Engineering Research Award in 1996 and the Chancellor’s Citation for Excellence in Research in 1998 at Syracuse University. He was an Associate Editor for feature articles of the IEEE Antennas and Propagation Society Newsletter (1986-1988), Associate Editor for the IEEE Transactions on Electromagnetic Compatibility (1986-1989), Chairman of the Inter-commission Working Group of International URSI on Time Domain Metrology (1990–1996), distinguished lecturer for the Antennas and Propagation Society from (2000-2003,2011-present), Member of Antennas and Propagation Society ADCOM (2004-2007), on the board of directors of ACES (2000-2006), vice president of the Applied Computational Electromagnetics Society (ACES), a member of the IEEE
Electromagnetics Award board (2004-2007) and an associate editor for the IEEE Transactions on Antennas and Propagation (2004-2010). He is also on the editorial board of Digital Signal Processing – A Review Journal, Journal of Electromagnetic Waves and Applications and Microwave and Optical Technology Letters. He is the chair of the International Conference Technical Committee of IEEE Microwave Theory and Techniques Society # 1 on Field Theory and Guided Waves. He is a member of Sigma Xi and International Union of Radio Science Commissions A and B. Currently, he is the 2013 president-elect of the IEEE Antenna sand Propagation Society. He is also the president of OHRN Enterprises, Inc., a small business incorporated in New York state (1985) performing various research work for various organizations in system analysis. He received Docteur Honoris Causa from Universite Blaise Pascal, Clermont Ferrand, France in 1998, from Politechnic University of Madrid, Madrid, Spain in 2004, and from Aalto University, Helsinki, Finland in 2012. He received the medal of the friend of the city of Clermont Ferrand, France, in 2000.

**Title:** The Challenge of Waveform Diversity  
**Speaker:** Prof. Hugh Griffiths, University College London, UK  
**Date:** 11:10-12:00, April 15, 2013, **Place:** Banquet hall

**Abstract:** Waveform Diversity is defined in the IEEE Std 868-2008 as Adaptivity of the radar waveform to dynamically optimize the radar performance for the particular scenario and tasks. May also exploit adaptivity in other domains, including the antenna radiation pattern (both on transmit and receive), time domain, frequency domain, coding domain and polarization domain. In other words, modern digital technology now allows us to generate precise, wide-bandwidth radar waveforms, and to vary them adaptively – potentially even on a pulse-by-pulse basis. This opens up many new possibilities, including ultra-low range sidelobe waveforms, orthogonally-coded waveforms for MIMO radar applications, waveforms with spectral nulls to allow co-existence with other transmissions without mutual interference, and so-called target-matched illumination, where a waveform may be matched to the impulse response of a specific target at a specific aspect angle. We may also learn from natural systems such as bats, whose acoustic signals are sophisticated and are used in an intelligent, cognitive manner. The lecture will describe the design of these waveforms and their applications, and the prospects for the future.

**Biography:** Hugh Griffiths holds the THALES/Royal Academy Chair of RF Sensors in the Department of Electronic and Electrical Engineering at University College London, England. From 2006–2008 he was Principal of the Defence Academy of Management and Technology. He received the MA degree in Physics from Oxford University in 1975, then spent three years working in
industry, before joining University College London, where he received the PhD degree in 1986 and the DSc(Eng) degree in 2000, and served as Head of Department from 2001 – 2006. His research interests include radar and sonar systems and signal processing (particularly synthetic aperture radar and bistatic and multistatic radar), and antenna measurement techniques. He has published over four hundred papers and technical articles in the fields of radar, antennas and sonar. In 1996 he received the IEEE AESS Fred Nathanson Award (Radar Systems Panel Award), and in 2012 he was awarded the IET A.F. Harvey Prize for his work on bistatic radar. He has also received the Brabazon Premium of the IERE and the Mountbatten and Maxwell Premium Awards of the IEE. He is a Fellow of the IET (previously IEE), Fellow of the IEEE, and in 1997 he was elected to Fellowship of the Royal Academy of Engineering. He serves as President of the IEEE Aerospace and Electronic Systems Society for 2012/2013, and he is an IEEE AES Distinguished Lecturer. He has been a member of the IEEE AES Radar Systems Panel since 1989, serving as Chair from 2007 – 2009, and chaired the Working Group which revised the IEEE Radar Definitions Standard P686 and reaffirmed the Radar Letter Band Standard.

**Title:** Compressive Urban Sensing  
**Speaker:** Prof. Moeness Amin, Villanova University, USA  
**Date:** 13:30-14:20, April 16, 2013, **Place:** Banquet hall  

**Abstract:** Urban sensing is an area that involves Imaging of building interiors. This is enabled by radar that uses electromagnetic (EM) waves for various purposes, including determining the building layout, discerning the building intent and nature of activities, locating and tracking the occupants, and even identifying and classifying inanimate objects of interest within the building. These capabilities are highly desirable for law enforcement, fire and rescue, and emergency relief, and military operations. High fidelity sensing and imaging can allow a police force to obtain an accurate description of building interior in a hostage crisis, or allow firefighters to locate people, which can be very critical, when trapped inside a burning structure. Towards the objective of providing timely actionable intelligence in urban environments, the emerging compressive sensing (CS) techniques have recently been shown to yield reduced cost, simplified hardware, and efficient sensing operations that allow super-resolution imaging of sparse behind-the-wall scenes. Compressive sensing is a very effective technique for scene reconstruction from a relatively small number of data samples without compromising the imaging quality. In general, the minimum number of data samples or sampling rate that is required for scene image formation is governed by the Nyquist theorem. However, when the scene is sparse, compressed sensing provides very efficient sampling, thereby significantly decreasing the required volume of data collected. Compressive Sensing for Urban Radars, or Compressive Urban Sensing (CUS), is an area of research and development which investigates the radar performance within the context of
compressive sensing and with a focus on urban applications. CUS examines the effect of using significantly reduced data measurements in time, space and frequency on 2D and 3D imaging quality, strong EM reflections from exterior and interior walls, target ghosts, and moving target detection and tracking. In this respect, CUS is a hybrid between the two areas of compressive sensing and urban sensing. In essence, it enables reliable imaging of indoor targets using a very small percentage of the entire data volume. In this talk, the theory of compressive sensing will be put in context for radar, in general, and in particular for the urban environment. We will explain how CS can achieve different radar sensing goals and objectives, and how it compares with the use of full data volumes. Different radar specifications and configurations will be used. In particular, we will address CS for urban radars towards achieving (a) Imaging through walls; (b) Detection of behind the wall targets; (c) Mitigation of wall clutter; and (d) Exploitation of multipath. All of the above issues will be examined using data generated at the Radar Imaging Lab, Villanova University.

**Biography:** Moeness Amin received his Ph.D. degree in 1984 from University of Colorado, in Electrical Engineering. In 1984, Dr. Amin joined the University of Colorado, Denver as a Visiting Assistant Professor. He has been on the Faculty of the Department of Electrical and Computer Engineering at Villanova University since 1985. In 2002, he became the Director of the Center for Advanced Communications, College of Engineering. Dr. Amin is the Recipient of the 2009 Individual Technical Achievement Award from the European Association of Signal Processing, and the Recipient of the 2010 NATO Scientific Achievement Award. He is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), 2001; Fellow of the International Society of Optical Engineering, 2007; and a Fellow of the Institute of Engineering and Technology (IET), 2010. Dr. Amin is a Recipient of the IEEE Third Millennium Medal, 2000; Recipient of the Chief of Naval Research Challenge Award, 2010; Distinguished Lecturer of the IEEE Signal Processing Society, 2003-2004; Chair of the Electrical Cluster of the Franklin Institute Committee on Science and the Arts; Recipient Villanova University Outstanding Faculty Research Award, 1997; and the Recipient of the IEEE Philadelphia Section Award, 1997. He is a member of IEEE, SPIE, EURASIP, ION, Eta Kappa Nu, Sigma Xi, and Phi Kappa Phi. Dr. Amin has over 550 journal and conference publications in the areas of Wireless Communications, Time-Frequency Analysis, Smart Antennas, Waveform Design and Diversity, Interference Cancellation in Broadband Communication Platforms, Anti-Jam GPS, Target Localization and Tracking, Direction Finding, Channel Diversity and Equalization, Ultrasound Imaging and Radar Signal Processing. He is a recipient of seven best paper awards. Dr. Amin currently serves on the Editorial Board of the IEEE Signal Processing Magazine. He also serves on the Editorial Board of the EURASIP Signal Processing Journal. He was a Plenary Speaker at ICASSP 2010. Dr. Amin was the Special Session Co-Chair of the 2008 IEEE International Conference on Acoustics, Speech, and Signal Processing. He was the Technical Program Chair of the 2nd IEEE International Symposium on Signal Processing and Information Technology, 2002. Dr. Amin was the General and Organization Chair of the IEEE Workshop on Statistical Signal and Array Processing, 2000. He was the General and
Organization Chair of the IEEE International Symposium on Time-Frequency and Time-Scale Analysis, 1994. He was an Associate Editor of the IEEE Transactions on Signal Processing during 1996-1998. He was a member of the IEEE Signal Processing Society Technical Committee on Signal Processing for Communications during 1998-2002. He was a Member of the IEEE Signal Processing Society Technical Committee on Statistical Signal and Array Processing during 1995-1997. He has given several keynote and plenary talks, and served as a Session Chair in several technical meetings. He organized seven Workshops and Seminars for the Franklin Institute Medal Award Program and the IEEE Philadelphia Section. Dr. Amin is a Guest Editor of the November-2013 Special Issue of the IEEE Signal Processing Magazine on Time-Frequency Analysis and Applications. He was the Guest Editor of the Journal of Franklin Institute September-08 Special Issue on Advances in Indoor Radar Imaging; a Guest Editor of the IEEE Transactions on Geoscience and Remote Sensing May-09 Special Issue on Remote Sensing of Building Interior; and a Guest Editor of the ET Signal Processing December-09 Special Issue on Time-Frequency Approach to Radar Detection, Imaging, and Classification.

**Title:** Research Progress on Circular Synthetic Aperture Radar  
**Speaker:** Prof. Wen Hong, Chinese Academy of Sciences, China  
**Date:** 14:20-15:10, April 16, 2013, **Place:** Banquet hall  

**Abstract:** Circular SAR (CSAR) is a newly developed all-directional high resolution 3D imaging working mode in recent years, to satisfy the demand of finer observation especially from different looking angles. The National Key Laboratory of Science and Technology on Microwave Imaging, Institute of Electronics, Chinese Academy of Sciences (MITL, IECAS) studies and had the first flight experiment with a P-band full polarization SAR system, and successfully obtained the all-directional high resolution Circular SAR images. Circular SAR imaging formation algorithms are firstly discussed here, which emphases on airborne experiments data processing. Then studies on the key techniques, and the development trends for this unique mode such as scattering mechanism research, 3D resolution with terrain illustration and it’s application on land cover classification with polarimetric data, etc. Initial results show that CSAR technique has the encouraging potential capability in the fields of high precision mapping, disaster evaluation, resource management and the other related applications.

**Biography:** Wen Hong had her Ms. and Ph.D. degree thesis work in Northwestern Polytechnical Univ.(NPU) and Beijing Univ. of Aeronautics and Astronautics(BUAA), in 1993 and 1997 respectively. After that till the year of 2002, she acted as a faculty staff in the Dept. of E.E., BUAA. In between, she was a guest scientist in the Microwaves and Radar Institute in German Aerospace Center (DLR-HF) in 1998. She joined the Institute of Electronics, Chinese Academy of Sciences (IECAS) since 2002 till now. As a researcher and a Ph.D. programm supervisor in the IECAS, her research interests are Pol/PolinSAR data
processing, 3D SAR data acquisition and processing, sparse signal processing in microwave imaging and etc.

**Title:** A Primer on Data Association  
**Speaker:** Prof. Peter Willett, University of Connecticut, USA  
**Date:** 16:10-17:00, April 16, 2013, **Place:** Banquet hall  

**Abstract:** To thread measurements (well, many call them “hits” or “plots”) of radar, sonar or imaging observations to a credible, smooth and reportable trajectory requires a filter. We’ll discuss those – Kalman, Unscented, particle, etc. – very briefly. But the main topic here arises because one cannot even begin to filter without knowing which hits come from which targets, and which hits are complete nonsense (clutter). When wrapped inside some scheme for such data-association, a filter becomes a tracker. This talk is intended to explain, at a fairly high level, the intuition behind some of the popular tracking algorithms.

**Biography:** Peter Willett has been a faculty member in the Electrical and Computer Engineering Department at the University of Connecticut since 1986. Since 1998 he has been a Professor, and since 2003 an IEEE Fellow. His primary areas of research have been statistical signal processing, detection, machine learning, communications, data fusion, and tracking. He was editor-in-chief for IEEE Transactions on Aerospace and Electronic Systems from 2006-2011, and is now the VP for Publications for the IEEE AES Society. For 1998-2005 he was associate editor for three active journals – IEEE Transactions on Aerospace and Electronic Systems (for Data Fusion and Target Tracking) and IEEE Transactions on Systems, Man, and Cybernetics, parts A and B. He is remains associate editor for the IEEE AES Magazine, and ISIF’s Journal of Advances in Information Fusion, and is a member of the editorial board of IEEE’s Special Topics in Signal Processing journal and a senior editor for IEEE Signal Processing Letters.

He has been a member of the IEEE AES Board of Governors (2003-2009, 2011-) and of ISIF 2010-2013. He was General Co-Chair (with Stefano Coraluppi) of IEEE/ISIF International Conference for Information Fusion (ICIF) in Florence in 2006, again was Executive Co-Chair (with Wolfgang Koch) for ICIF in Cologne in 2008, and was also Emeritus Chair (with Darin Dunham and Amy Smith-Carroll) for ICIF in Chicago in 2011. He was Program Co-Chair (with Eugene Santos) of the IEEE Conference on Systems, Man, and Cybernetics, held in Washington, DC in October of 2003. He was Program Co-Chair (with PramodVarshney) for the 1999 ICIF. He has been a member of the IEEE Signal Processing Society’s Sensor-Array and Multichannel (SAM) technical committee since 1997 and is now Vice Chair.
Title: MIMO Radar with Distributed Antennas  
Speaker: Prof. Rick S. Blum, Lehigh University, USA  
Date: 17:00-17:50, April 16, 2013, Place: Banquet hall

Abstract: Inspired by recent advances in multiple-input multiple-output (MIMO) communications, this tutorial introduces the widely spread antenna MIMO radar concept. MIMO systems have had great impact on wireless communications. The signal model for MIMO radar with distributed antennas bears similarities to the communications signal model, suggesting the possibility of interesting cross-fertilization of ideas between MIMO communications and MIMO radar. We will demonstrate that complex targets contain a large number of scatterers that result in diverse RCS patterns as a function of aspect angle. We will specify the conditions for decorrelation of the elements of the channel matrix in terms of separation between antennas, target size, target range, and carrier wavelength. We will discuss parallels to MIMO communication, in particular the similar roles that the transmission medium (channel) and target play in respectively, communication and radar. We will show that combining target returns resulting from independent illuminations yields a diversity gain akin to the diversity gain obtained in the communication problem over fading channels when the data is transmitted through independent channels. We will develop the optimal detectors for MIMO radar, and for comparison, for other radar architectures. For very widely spaced antennas, optimal processing combines sensor outputs non-coherently. From the non-coherent combination of sensor outputs, we will switch to MIMO radar with coherent processing of sensor outputs. We will show that MIMO radar can locate targets with high resolution and can resolve between closely spaced targets. The Cramer-Rao lower bound on the achievable accuracy will be discussed, and it will be shown to depend on both the carrier frequency and the sensors’ locations.

Biography: Rick S. Blum received a B.S. in Electrical Engineering from the Pennsylvania State University in 1984 and his M.S. and Ph.D in Electrical Engineering from the University of Pennsylvania in 1987 and 1991. From 1984 to 1991 he was a member of technical staff at General Electric Aerospace in Valley Forge, Pennsylvania and he graduated from GE’s Advanced Course in Engineering. Since 1991, he has been with the Electrical and Computer Engineering Department at Lehigh University in Bethlehem, Pennsylvania where he is currently a Professor and holds the Robert W. Wieseman Chaired Research Professorship in Electrical Engineering. His research interests include signal processing for communications, sensor networking, radar and sensor processing. He is on the editorial board for the Journal of Advances in Information Fusion of the International Society of Information Fusion. He was an associate editor for IEEE Transactions on Signal Processing and for IEEE Communications Letters. He has edited special issues for IEEE Transactions on Signal Processing, IEEE Journal of Selected Topics in Signal Processing and IEEE Journal on Selected...
Areas in Communications. He is a member of the SAM Technical Committee (TC) of the IEEE Signal Processing Society. He was a member of the Signal Processing for Communications TC of the IEEE Signal Processing Society and is a member of the Communications Theory TC of the IEEE Communication Society. He was on the awards Committee of the IEEE Communication Society. Dr. Blum is a Fellow of the IEEE, an IEEE Third Millennium Medal winner, a member of Eta Kappa Nu and Sigma Xi, and holds several patents. He was awarded an ONR Young Investigator Award in 1997 and an NSF Research Initiation Award in 1992. His IEEE Fellow Citation "for scientific contributions to detection, data fusion and signal processing with multiple sensors" acknowledges some early contributions to the field of sensor networking.
Tutorials

Title: Forest Applications with Satellite and Airborne Radar
Speaker: Prof. David G. Goodenough, Natural Resources Canada, Canada
Date: 15:00-17:30, April 14, 2013, Place: No. 7 conference room

Abstract: In order to monitor the forest resources and environment of the planet, it is necessary to use remote sensing from multiple sensors and integrate these data with historical information contained within geographical information systems (GIS). Multiple sensors are required to identify attributes of interest. In forestry, resource managers want to know the amount of the resource by species, area, timber volume, etc., the spatial distribution, the health (chemistry) of the forests, and the temporal changes of the resource, both past and predicted for the future. The radar and hyperspectral technologies are used to create information systems to support resource and environmental management. In this tutorial we explore radar methods and systems to obtain valuable forest information, such as current and historical fire scars, harvesting patterns, forest typing, and biomass. When combined with species information, we can also create maps of above-ground carbon. Radars provide all-weather monitoring capability vital for detecting illegal harvesting. National and global monitoring requires integrated systems for distributed data management. These systems require multiple frequencies, polarization, multiple angles, interferometry and polarimetry. We will discuss the operational requirements for effective radar monitoring of forests. Examples of work for forest applications will be presented.

Biography: David G. Goodenough is an Adjunct Professor of Computer Science, Faculty of Engineering, at the University of Victoria (UVic). He has graduate students and is a NSERC recipient. Dr. Goodenough holds the following degrees: Ph.D. and M.Sc. (University of Toronto), and B.Sc. (University of British Columbia). Dr. Goodenough worked at the Canada Centre for Remote Sensing (1973-1991), where he was a Chief Research Scientist and Head of the Knowledge-Based Methods and Systems Section. He was an Adjunct Professor of Electrical Engineering at the University of Ottawa (1979-1996). In 1991, he joined as a Chief Research Scientist the Pacific Forestry Centre of the Canadian Forest Service, Natural Resources Canada. He was a recipient of the IEEE Third Millennium Medal (2000). He was President of the IEEE Geoscience and Remote Sensing Society (GRSS) (1992-1993) and served as Past-President (1994-1996). He became a Fellow of the IEEE in 1997. He was a member of the IEEE Fellow Committee. Dr. Goodenough has served the IEEE GRSS as an AdCom Member from 1986 to 2008. He was General Co-Chairman for IGARSS 2000 and was Technical Program Co-Chairman for IGARSS 2002. He has published extensively (>250 papers) and presented frequently (>700 presentations). He is a recipient of the following awards: the IEEE GRSS Distinguished
Achievement Award (2006); the 2004 Gold Medal of the Canadian Remote Sensing Society, Canadian Aeronautics and Space Institute; the Government of Canada’s Award of Excellence; the IEEE GRSS Outstanding Service Award; a Natural Resources Canada Departmental Merit Award; an EMR Merit Award, and NASA Group Achievement Awards. Dr. Goodenough was Principal Investigator of the NASA project, Evaluation and Validation of EO-1 for Sustainable Development (EVEOSD). He led the automation research and development team for the EOSD Project. He is Principal Investigator of the ESA Project, Evaluation and Validation of CHRIS, and leads the Methods and Systems Study. He was PI of a Forest Hyperspectral Applications Project with CSA. He was the PI of CSA’s Radarsat-2 Forest Applications Project and a Co-I on UVic’s Scientific GRID Computing Project, a CANARIE project. He led the SAFORAH project (www.saforah.org). Dr. Goodenough is a member of the IEEE Geoscience and Remote Sensing Society, the Computer Society, and the Systems, Man, and Cybernetics Society. He is also a member of the Canadian Remote Sensing Society and the Canadian Aeronautics and Space Institute.

Title: Methods and Algorithms for Understanding of High Resolution SAR Images: Towards a SARINT Concept

Speaker: Mihai Datcu, German Aerospace Center DLR, Germany

Date: 19:30-22:00, April 14, 2013, Place: VIP room

Abstract: Synthetic Aperture Radar (SAR) imagery, in the last two decades, has become increasingly popular as some of its properties are favorable and complementary to optical imagery. With the increase of the SAR sensor performance up to sub-meter resolution, a more detailed analysis and a finer description of SAR images over scenes, mainly object of human activities areas, are needed. The high diversity of man-made structures combined with the complexity of the scattering processes makes the analysis and information extraction, from high resolution SAR images over such areas, non-trivial. Since SAR provides N-dimensional complex valued signals, i.e. the information on the scene or target is modulating in amplitude, frequency or phase the radar echoes, the SAR data interpretation requires very specific techniques, to adapt to its “non-visual” nature. In addition the “sub-meter” resolution makes possible the detailed observation of man-made structures, thus the importance of SAR information is growing dramatically. In this frame is needed to develop expertise and tools for semi-automatic or automatic support to SAR data understanding and SAR Intelligence (SARINT). The tutorial aims at presenting advanced methods for SAR image understanding based on interactive and automatic algorithms. The methods are intended for the analysis of the most used products: detected and single look complex images, and supported by coherent multiple observations in InSAR modes. The inclusion of model knowledge obtained from collections of pre-recorded physical target data leads to a comparison of the acquired
data with representative models. Similarities and deviations revealed during the comparison allow a detailed high resolution interpretation of the image data and lead to a full image understanding. The lecture will give practical examples using TerraSAR-X images.

**Biography:** Mihai Datcu received the M.S. and Ph.D. degrees in electronics and telecommunications from the University Politehnica of Bucharest (UPB), Romania, in 1978 and 1986, respectively. In 1999, he received the title "Habilitation à diriger des recherches" in computer science from University Louis Pasteur, Strasbourg, France. Since 1981, he has been a Professor with the Faculty of Electronics, Telecommunications and Information Technology, UPB, working in signal/image processing and Electronic Speckle Interferometry. Since 1993, he has been a scientist with the German Aerospace Center (DLR), Oberpfaffenhofen, Germany. He is developing algorithms for analyzing Very High Resolution Synthetic Aperture Radar (VHR SAR) and Interferometric SAR (InSAR) data. He is engaged in research related to information theoretical aspects and semantic representations in advanced communication systems. Currently, he is Senior Scientist and Image Analysis research group leader with the Remote Sensing Technology Institute of DLR, Oberpfaffenhofen. Since 2011, he is also leading the Immersive Visual Information Mining research laboratory at the Munich Aerospace Faculty and is director of the Research Center for Spatial Information at UPB. He has held Visiting Professor appointments with the University of Oviedo, Spain, University Louis Pasteur and the International Space University, in Strasbourg, France, University of Siegen, Germany, University of Camerino, Italy, and the Swiss Center for Scientific Computing, Manno, Switzerland. From 1992 to 2002 he had a longer Invited Professor assignment with the Swiss Federal Institute of Technology, ETH Zurich. Since 2001, he has initiated and leaded the Competence Centre on Information Extraction and Image Understanding for Earth Observation, at ParisTech, Telecom Paris, a collaboration of DLR with the French Space Agency (CNES). He has been Professor holder of the DLR-CNES Chair at ParisTech, Telecom Paris. His interests are in information and complexity theory, stochastic processes, Bayesian inference, and Image Information Mining (IIM). He and his team have developed and are currently developing the operational IIM processor in the Payload Ground Segment systems for the German missions TerraSAR-X, TanDEM-X, and the ESA Sentinel 1 and 2. He is the author of more than 200 scientific publications, among them about 50 journal papers, and a book on number theory. He is a member of the European Image Information Mining Coordination Group (IIMCG) and of the Data Archiving and Distribution Technical Committee (DAD TC) of the IEEE Geoscience and Remote Sensing Society, and IEEE Fellow.
Title: Ground Penetrating Radar (GPR) / UWB radar: Fundamentals to applications

Speaker: Prof. Motoyuki Sato, Tohoku University, Japan

Date: 19:30-22:00, April 14, 2013, Place: No. 7 conference room

Abstract: Ground Penetrating Radar (GPR) is one form of radar, which is used for subsurface sensing. It has been widely used for detection of buried utilities such as pipes and cables. This technique is also highly sensitive to water content in soil; therefore, GPR is very suitable for environment study, too. Recently, Ultra Wide Band (UWB) technology has gathered interest, however, its frequency bandwidth has been used in GPR for a long time, and we can find many similar aspects. Typical application of UWB radar is detection of objects in air, however, most of the fundamental signal acquisition and signal processing schemes are almost as same as that has been used in GPR. In this tutorial course, we will introduce the fundamental principles of GPR and UWB radar technologies to potential users, students and researchers. The course will cover electromagnetic wave propagation and reflection in material, antennas for GPR, GPR system, GPR survey design, signal processing, and image reconstruction. Then we will introduce examples of applications of GPR and UWB radars, which include our recent activities for humanitarian demining by ALIS. GPR technology is closely related to Electromagnetic wave theory and signal processing technology. Therefore, I believe this course is also very useful for researchers and students who are familiar with electrical communications and signal processing theory.

Biography: Motoyuki Sato received the B.E., M.E degrees, and Dr. Eng. degree in information engineering from the Tohoku University, Sendai, Japan, in 1980, 1982 and 1985, respectively. Since 1997 he is a professor at Tohoku University and a distinguished professor of Tohoku University since 2007, and he was the Director of Center for Northeast Asian Studies, Tohoku University since 2009-2012. From 1988 to 1989, he was a visiting researcher at the Federal German Institute for Geoscience and Natural Resources (BGR) in Hannover, Germany. His current interests include transient electromagnetics and antennas, radar polarimetry, ground penetrating radar (GPR), borehole radar, electromagnetic induction sensing, interferometric and polarimetric SAR. He has conducted the development of GPR sensors for humanitarian demining, and his sensor ALIS which is a hand-held dual sensor, has detected more than 80 mines in mine fields in Cambodia since May 2009. He is a visiting Professor at Jilin University, China, Delft University of Technology, The Netherlands, and Mongolian University of Science and Technology. He was the technical chair of International conference on Ground Penetrating Radar, GPR96 held in Sendai, Japan and he served the general chair of IGARSS2011.
**Title:** Tutorial on SAR earth observation  
**Speaker:** Prof. Leo P. Ligthart, Delft University of Technology, Netherlands  
**Date:** 19:30-22:00, April 15, 2013, **Place:** VIP room  

**Abstract:** In the first part of the tutorial the fundamentals of SAR are discussed. Topics are:  
1. SAR utilization  
2. SAR principle  
3. SAR processing  
4. Polarimetric SAR  
5. SAR Interferometry  
6. SAR system design  
7. Air-borne SAR  
8. Space-based SAR  

The second part focuses on SAR images illustrating the strengths of SAR in various application areas. Recent advances in space-based SAR missions are presented followed by an overview of potential ultra-wide-band (UWB) SAR applications. Ground-based UWB SAR systems are overviewed and compared with MIMO radar. The tutorial will be concluded with some latest developments on air-borne and ground-based FMCW SAR.  

**Biography:** Leo P. Ligthart received an Engineer's degree (cum laude) and a Doctor of Technology degree from Delft University of Technology in 1969 and 1985, respectively. He is Fellow of IET and IEEE. He got awards from UK-IET, IEEE MIKON conference, EuMA, Netherlands electronic and radio society (NERG). He is Honorary Member of the Delft EE student society. He received Honorary Doctorates (Honoris Causa) at Moscow State Technical University of Civil Aviation in 1999, Tomsk State University of Control Systems and Radioelectronics in 2001 and Military Technical Academy, Romania in 2010. He is academician of the Russian Academy of Transport. Since 1988, he has held the chair on radar and from 1992 he has held the chair of Microwave Transmission, Radar and Remote Sensing in the Faculty of Electrical Engineering, Mathematics and Computer Science, Delft University of Technology, The Netherlands. In 1994, he founded the International Research Center for Telecommunications and Radar (IRCTR) at Delft University and has been the director of IRCTR for more than 16 year. He is founding member of the European Microwave Association, chaired the first European Microwave Week (EuMW) and initiated the European Radar Conference (EuRAD) in 2004. He was project manager of more than 30 multi disciplinary projects valued over k€ 40.000. He was advisor of more than 50 PhD candidates. Currently Prof. Ligthart is emeritus professor of Delft University, guest professor at University Indonesia, consultant at LIPI (science foundation Indonesia), Scientific advisor of IRCTR-I, Chairman of CONASENSE (a global initiative on communications, navigation, sensing services), Chairman of ICT Friesland, Netherlands, Board of governors CTIF, Denmark and Board of Governors IEEE-AESS. He has been invited to give courses on radar, microwave remote sensing, antenna systems, sparse arrays at various universities and institutes in China, India, Indonesia, Australia, South Africa, Italy, Turkey, etc. His principal areas of specialization include antennas and propagation, radar and remote sensing, but he has also been active in satellite, mobile and radio communications. He has published over 600 papers and various book chapters and 2 books.
**Title:** Saving Lives Using Radar  
**Speaker:** Dr. Alan Jenkins, Autoliv, Germany  
**Date:** 19:30-22:00, April 15, 2013, **Place:** No. 7 conference room  

**Abstract:** The idea of using radar systems for crash prevention on automobiles has been around for some considerable time. It has only been in the last 10 years or so that these systems have been small enough and cost effective enough to put on vehicles, and only until recently as standard equipment on lower end cars. Many factors affect the development of such systems besides the basic operation of the radar system. Functional Safety, regulatory compliance, harsh operating environment and a complex set of features that need to be supported are some of these. This lecture will focus on the applications that new radar systems are addressing and will be required to address in the future, as well as discussing the state of the art of radar systems available today. Regulatory as well as technological factors that affect the development path for such systems will also be addressed. Alternative technologies (such as vision/night vision systems) will be discussed in a competitive/complementary way. Measured data for real world crash scenarios for various sensor types will be shown. As the industry moves forward from Driver Assistance features towards more advanced Driver Safety features, the demands on radar systems increase, which in turn puts pressure on the radar engineer to get more and better quality information from the vehicles surroundings. The ultimate goal of this is reducing the fatalities on the road, or said another way, using radar systems to save people’s lives in the real world.

**Biography:** Alan Jenkins received his PhD in Microwave Applications of High Temperature Superconductors in 1995 from the University of Oxford. During the following six years he was employed as a Junior Research Fellow where he conducted research on subjects ranging from propagation studies at 2.5 GHz and 40GHz, superconductor material RF parameter measurement and advanced filter design. In 2001 he moved to the US to work for M/A-com in the R&D Group developing SiGeMMIC’s at 24GHz for communications and radar systems and undertaking various system engineering developments. In 2009 he became part of the acquisition of the Automotive Radar group by Autoliv where he has worked since, looking at MMIC design, system engineering and advanced development for Automotive Ultra Wideband Radar at 24GHz. He currently is on assignment in Germany to start a new advanced development program looking at next generation 77GHz radar and active safety systems for automotive applications. Dr. Jenkins is author and co-author of over 50 papers, 5 patents and is a Senior Member of the IEEE.
Oral Session

Session 1: Special Session on Bistatic SAR
Time: 13:30—15:30, April 15, 2013, Place: VIP room
Chairs: Dr. Michail Antoniou, University of Birmingham, UK
Dr. Cheng Hu, Beijing Institute of Technology, China

B0315 EXPERIMENTAL DEMONSTRATION OF PASSIVE GNSS-BASED SAR IMAGING MODES
M. Antoniou, M. Cherniakov
University of Birmingham, UK

B0557 EXPERIMENTAL IMAGE FORMATION OF SS-BISAR SYSTEMS WITH FIXED RECEIVER USING MODIFIED RMA ALGORITHM
Feifeng Liu*, Cheng Hu*, Mike Antoniou#, Tao Zeng*, Mike Cherniakov#
*Beijing Institute of Technology, China
#University of Birmingham, UK

B0525 AN AUTOFOCUSING APPROACH FOR AIRBORNE-STATIONARY BISTATIC SAR IMAGERY BASED ON ACQUIRED RAW DATA
Zhou Song1, Yang Lei2, Xia Xiang-Gen3, Li Ya-chao1, Bao Zheng1
1 Xidian University, China,
2 Nanyang Technological University, Singapore.
3 University of Delaware, USA.

D0592 A NOVEL METHOD OF NON-COOPERATIVE SPACE-SURFACE BISTATIC SAR IMAGE GEO-RECTIFICATION
Tian Zhang, Weiming Tian*, Tao Zeng, Cheng Hu
Beijing institute of technology, China

B0325 EXPERIMENTAL RESULTS AND ANALYSIS FOR BISTATIC SAR INTERFEROMETRY USING STATIONARY RECEIVER
Zhu Mao1, Hu Cheng1*, Zeng Tao1, Gao Yangte2, Wu Lixin1
1Beijing Institute of Technology, China
2China academy of space technology, China

D0121 AN ALGORITHM FOR DETECTION OF HIDDEN OBJECTS BY PASSIVE/ACTIVE Radiometer
S.I. Ivashov*, A.S. Bugaev**, A.S. Turk***, A.V. Zhuravlev*
*Bauman Moscow State Technical University
**Moscow Institute of Physics and Technology
*** Yıldız Technical University, Istanbul, Turkey
Session 2: Target Characteristics and Recognition

Time: 13:30—15:30, April 15, 2013, Place: No. 7 conference room

Chairs: Dr. Derek Gray, University of Nottingham-Ningbo, China
Dr. Xiongjun Fu, Beijing Institute of Technology, China

C0625 IDENTIFICATION OF MULTIPLE OBJECTS USING THEIR NATURAL RESONANT FREQUENCIES FROM BOTH FREQUENCY AND TIME DOMAIN DATA
W. Lee, T.K. Sarkar*, H. Moon, M. Salazar-Palma
*Syracuse University, USA

D0225 CLASSIFICATION SCHEME FOR AIRPLANE TARGETS BASED ON EMPIRICAL MODE DECOMPOSITION
Wang Baoshuai*, Du Lan*, Li Yanbing, Ruan Long, Liu Hongwei
Xidian University, China

D0412 RADAR EMITTER SIGNAL RECOGNITION BASED ON TIME-FREQUENCY ANALYSIS
L.B. Yang1, S.S. Zhang1,2, B. Xiao1
1 University of Electronic Science and Technology of China
2 Laboratory of Integrated Electronic System, Ministry of Education, China

D0578 MICRO-DOPPLER OF NON-IDEAL SCATTERING CENTERS
Liu Jin1,2*, Zhao Feng1,2, Zhang Yanqing3, Ai Xiaofeng1,2, Yang Jianhua1,2
1 State Key Laboratory of Complex Electromagnetic Environment Effects on Electronics and Information System, China
2 National University of Defense Technology, China
3 Unit 61135 of PLA, China

D0265 EXTENDED FRACTAL ANALYSIS OF SEA CLUTTER FREQUENCY SPECTRUM
Wang Guo-Qing, Liu Ning-Bo, Bao Zhong-Hua, Guan Jian
Naval Aeronautical and Astronautical University, China

F0721 MICRO-MOTION ANALYSIS BASED ON HRRP SEQUENCE
W. Lee, T.K. Sarkar*, H. Moon, M. Salazar-Palma
1 Taiyuan Satellite Launch Center, China
2 14th Research Institute of China Electronic Technology Group Corporation, China
Session 3: Radar Application
Time: 13:30—15:30, April 15, 2013, Place: No.10 conference room
Chairs: Dr. Alan Jenkins, Autoliv, Germany
        Prof. Yu Zhang, Xidian University, China

E0512 AN IMPLANTABLE STRIPLINE-FED SLOT ANTENNA FOR BIOMEDICAL
APPLICATIONS
Xuyang Li, Malyhe Jalilvand, Wendy You, Werner Wiesbeck and Thomas Zwick
Karlsruhe Institute of Technology (KIT), Germany

A0596 EXPERIMENTAL STUDY USING NATURAL FREQUENCIES FOR FRUIT
IDENTIFICATION
T. Tantisopharak*, M. Krairiksh* and T. K. Sarkar**
*King Mongkut’s Institute of Technology Ladkrabang, Thailand
** Syracuse University, USA

C0643 A STUDY OF MMW COLLISION AVOIDANCE RADAR SYSTEM FOR TRAINS
Liu Haibo, ShengMengmeng, Yang Xiaoqian
Beijing Institute of Technology, China

C0298 KU-BAND STEP FREQUENCY GROUND-BASED SAR SYSTEM AND
EXPERIMENTS
Peng Xueming*, Lu Xuguang, Tan Weixian, Wang Yanping, Hong Wen, Wu Yirong
Chinese Academy of Sciences, China

A0633 ELECTRICALLY SCANNED SLOPE MONITORING RADAR WITH ANTENNA
SWITCHING
Wang Hao-fei, Ren Li-xiang*, Mao Er-ke*
Beijing Institute of Technology, China

B0401 HIGH-RESOLUTION FM STEPPED-FREQUENCY MINISAR SYSTEM
Weiming Tian, Di Yao*, Tao Zeng
Beijing Institute of Technology, China

Session 4: Signal Processing
Time: 13:30—15:30, April 15, 2013, Place: No.8 conference room
Chairs: Prof. Jie Yang, Northeastern University, China
        Dr. Shiwei Dong, Science and Technology on Space Microwave Laboratory,
        CAST, China

D0264 AN ALTERNATIVE ALGORITHM FOR WAVE INFORMATION EXTRACTION
FROM X-BAND NAUTICAL RADAR IMAGES
Weimin Huang, Eric W. Gill
Memorial University, Canada
D0710 FAST AND ACCURATE INTERPOLATION OF FREQUENCY DOMAIN RESPONSE FROM NON-UNIFORM SAMPLING
Jie Yang
Northeastern University, China

F0222 ARALLEL MULTILEVEL FAST MULTIPOLE ALGORITHM FOR ANALYSIS OF TARGETS ABOVE GROUND
Xun-Wang Zhao*, Sio-Weng Ting¹, Ji-Rong Zhou¹, Yu Zhang¹,
Daniel Garcia Donoro³
¹Xidian University, China
²University of Macau, China
³Universidade Carlos III of Madrid, Spain

B0573 A COMPRESSED SENSING METHOD FOR A WIDER SWATH IN SYNTHETIC APERTURE IMAGING
Huichen Yan¹, Jia Xu¹,², Shibao Peng¹, Xudong Zhang¹
¹Tsinghua University, China
²Beijing Institute of Technology, China

D0599 HIGH RESOLUTION RANGE PROFILE WITH PROMOTED SPARSITY AND REFINED GRID
Z.C. Liu, G.H. Zhao*, X.L. Wang, G.M. Shi
Xidian University, China

F0339 WALL PARAMETER ESTIMATION USING PROPAGATION TIME DELAY
A. Shahid, A. Ghafoor, M. M. Riaz
National University of Sciences and Technology (NUST), Pakistan

Session 5: Special Session on GEO SAR/InSAR
Time: 16:30—18:30, April 15, 2013, Place: VIP room
Chairs: Prof. Stephen Hobbs, Cranfield University, UK
Prof. Qingjun Zhang, Beijing Institute of Spacecraft System Engineering, China

C0737 SIMULATION OF GEOSYNCHRONOUS RADAR AND ATMOSPHERIC PHASE COMPENSATION CONSTRAINTS
S.E. Hobbs*, B. Snapir, R. Corstanje, C. Mitchell, B. Forte, R. Holley, P. Whittaker, K. Graham and R. Burren
Cranfield University, UK

B0317 IMPROVED TWO-STEP ALGORITHM IN GEOSYNCHRONOUS SAR
W. Yang*, Z. Ding*, Y. Zhu**, C. Ni**, C. Hu*
* Beijing Institute of Technology, China
**Chinese Academy of Space Technology, China
B0301 FEATURE ENHANCEMENT OF INSAR IMAGING USING JOINT SPARSE CONSTRAINTS OF MAGNITUDE AND PHASE
Gang Xu, Lei Zhang, Meng-dao Xing
Xidian University, China

B0465 A METHOD OF DETERMINING THE DIRECTION OF VELOCITY SPACE-VARIANCE IN GEO SAR
Teng Long¹, Ye Tian¹, Cheng Hu¹*, Zegang Ding¹, Chong Ni²
¹Beijing Institute of Technology, China
²Beijing Institute of Spacecraft System Engineering, China

B0189 SIMULATION OF VOLUME SCATTERING IN SAR INTERFEROMETRY SYSTEM
Zaoyu Sun*, Guanghu Jin, Zhen Dong
National University of Defense Technology, China

B0496 GEO SAR INTERFEROMETRY: THEORY AND FEASIBILITY STUDY
Cheng Hu¹*, Xiaorui Li¹, Teng Long¹, Yangte Gao², Zegang Ding¹
¹Beijing Institute of Technology, China
²China academy of space technology, China

Session 6: DBF
Time: 16:30—18:30, April 15, 2013, Place: No. 7 conference room
Chairs: Prof. François Le Chevalier, Thales Air Operations, France
Prof. Yilong Lu, Nanyang Technological University, Singapore

D0449 MULTIPLE SOURCES DOA AND POLARIZATION ESTIMATIONS USING VECTOR CIRCULAR ARRAY
L. Huang, Y.L. Lu*
Nanyang Technological University, Singapore

D0748 CRAMER-RAO BOUND OF DIRECTION OF ARRIVAL ESTIMATION IN PRESENCE OF MUTUAL COUPLING
Xinyu Zhang, Yang Li*, and Dinghong Lu
Beijing Institute of Technology, China

D0526 MULTI-TARGET FREQUENCIES AND DIRECTIONS ESTIMATION ALGORITHM FOR MONOBIT DIGITAL WIDEBAND ARRAY RECEIVER
JinZe Zhang¹,², Xiaolu Guo¹, Xiao Gao², Haihong Tao¹, Weiping Li¹
¹Xidian University, China
²Equipment Academy of Airforce, China
D0343  ROBUST DOA ESTIMATION FOR A MIMO ARRAY USING TWO CALIBRATED TRANSMIT SENSORS
Wei Zhang*, Wei Liu*, Siliang Wu*, and JuWang*
*Beijing Institute of Technology
*University of Sheffield

D0277  A DETERMINISTIC APPROACH OF ARRAY THINNING
Ehsan Tohidi*, Mohammad A. Sebt**, and Mohammad M. Nayebi***
*Sharif University of Technology, Iran
**K. N. Toosi University of Technology, Iran
***Sharif University of Technology, Iran

D0281  A FAST AND NOVEL METHOD OF PATTERN SYNTHESIS FOR NON-UNIFORM PHASED ARRAY ANTENNAS
Ehsan Tohidi*, Mohammad A. Sebt**, and Mohammad M. Nayebi***
*Sharif University of Technology, Iran
**K. N. Toosi University of Technology, Iran
***Sharif University of Technology, Iran

Session 7: Radar System
Time: 16:30—18:30, April 15, 2013, Place: No.10 conference room
Chairs: Prof. Motoyuki Sato, Tohoku University, Japan
        Dr. Lanying Cao, AVIC Radar and Avionics Institute, China

G0147  THE INDUSTRIAL CHALLENGES OF AIRBORNE AESA RADARS
Stephane Kemkemian, Alain Larroque, Cyrille Enderli
Thales Airborne Systems, France

C0313  HYCAM: A NEW S BAND SURFACE RADAR TESTBED
P. Brouard, L. Constancias, A. Brun, S. Attia, J. Peyret, P. Dreuillet
ONERA, chemin de la Hunière, FRANCE

D0460  NEW METHOD FOR PASSIVE RADAR SEEKER TO ANTAGONIZE NON-COHERENT RADAR DECOY
Zhang Liang, Xu Zhen-Hai, Xiong Zi-Yuan, Wang Xue-Song
National University of Defense Technology, China

B0546  GB-SAR DEFORMATION MONITORING: PERFORMANCE ANALYSIS AND PRIMARY EXPERIMENTAL RESULTS
Tao Zeng¹, Cong Mao², Feifeng Liu*, Chong Ni⁴, Cheng Hu⁵
¹, ², ³*, ⁵Beijing Institute of Technology, China
⁴Beijing Institute of Spacecraft System Engineering, China
D0341  ADAPTIVE GROUND CLUTTER SUPPRESSION FOR AIRBORNE WEATHER RADAR BASED ON ECHOES POWER
Renbiao Wu, Yanfei Han, Hai Li
Civil Aviation University of China

Session 8: Waveform Design
Time: 16:30—18:30, April 15, 2013, Place: No.8 conference room
Chairs: Prof. Jinhwan Koh, Gyeongsang National University, South Korea
Prof. Jia Xu, Beijing Institute of Technology, China

C0745  SPACE-TIME CODES FOR ACTIVE ANTENNA SYSTEMS: COMPARATIVE PERFORMANCE ANALYSIS
G. Babur*, P. Aubry*, F. Le Chevalier*
*Delft University of Technology, The Netherlands

C0440  EMPIRICAL PERFORMANCE ANALYSIS OF LINEAR FREQUENCY MODULATED PULSE AND MULTITONES ON UWB SOFTWARE DEFINED RADAR PROTOTYPE
J. Le Kernec¹, O. Romain²
¹ University of Nottingham Ningbo, Ningbo, China
² Université Cergy Pontoise, France

G0221  ADAPTIVE WAVEFORM DESIGN IN RANDOM STEPPED FREQUENCY RADAR
Tianyao Huang, Yimin Liu, Huadong Meng, Xi Qin Wang
Tsinghua University, China

B0558  EXPERIMENTAL VERIFICATION OF STEPPED FREQUENCY CONTINUOUS WAVE GROUND-BASED SAR
Zhenyu Ding¹,²,³, Yanping Wang¹,², Weixian Tan¹,², Wen Hong¹,²
¹ Science and Technology on Microwave Imaging Laboratory, China
² Chinese Academy of Sciences, China
³ University of Chinese Academy of Sciences, China

D0422  LEAST-SQUARE SYNTHESIS OF CROSS AMBIGUITY FUNCTION FOR WPM-OFDM RADAR SIGNALS
Mostafa Alimosaymer, Reza Mohseni
Shiraz University of Technology, Iran
Session 9: Special Session on Multi-Dimension SAR  
Time: 08:00-10:00, April 16, 2013, Place: VIP room  
Chairs: Prof. David G. Goodenough, Natural Resources Canada, Canada  
        Prof. Wen Hong, Chinese Academy of Sciences, China  

B0514 COMPACT RADAR POLARIMETRY FOR FIRE SCAR MAPPING AND LANDCOVER CLASSIFICATION  
      H. Chen¹, D.G. Goodenough¹², S.R. Cloude³  
      ¹Canadian Forest Service, Natural Resources Canada, Canada  
      ²Computer Science Department, University of Victoria, Canada  
      ³AEL Consultants, UK  

B0071 A RANGE-VARIANT CHANNEL-CALIBRATION ALGORITHM FOR THE MULTI-CHANNEL IN AZIMUTH HRWS SAR IMAGING  
      Shuangxi Zhang*, Yi Liao, Guangcai Sun and Mengdao Xing  
      Xidian University, China  

B0486 EXPERIMENTAL FORMATION ALGORITHM BASED ON DIRECT WAVE OF BISAR WITH THE SQUINT TRANSMITTER AND A FIXED RECEIVER  
      Zeng Tao, Wu Lixin, Hu Cheng*, Gao Yangte  
      Beijing Institute of Technology, China  

B0072 EDGE DETECTION FOR POLARIMETRIC SAR IMAGES COMBINING ADAPTIVE OPTIMAL POLARIMETRIC CONTRAST ENHANCEMENT ANDROA OPERATOR  
      Shaoping Deng a,b,*, Pingxiang Li a, Jixian Zhang b, Jie Yang a  
      a Wuhan University, China  
      b Chinese Academy of Surveying and Mapping, China  

B0420 A NOVEL CHANNEL PHASE BIAS ESTIMATION METHOD FOR SPACEBORNE ALONG-TRACK MULTI-CHANNEL HRWS SAR IN TIME-DOMAIN  
      Yanyang Liu, Zhenfang Li, Zhiyong Suo, Zheng Bao  
      Xidian University, China  

B0266 A NOVEL POLARIMETRIC SAR SHIP DETECTION FILTER  
      Xi Zhang*, Jie Zhang, Jun-min Meng, Li-min Chen  
      First Institute of Oceanography, State Oceanic Administration (SOA), China  

Session 10: Special Session on Ground Penetrating/Thru-Wall Radar  
Time: 08:00-10:00, April 16, 2013, Place: No. 7 conference room  
Chairs: Prof. Moeness Amin, Villanova University, USA  
        Prof. Lingjiang Kong, University of Electronic Science and Technology of China, China
NEW GROUND PENETRATING RADAR SYSTEM FOR QUANTITATIVE CHARACTERIZATION OF SNOW AND SEA ICE
Hai Liu*, Xiongyao Xie¹ and Motoyuki Sato²
¹Tongji University, China
²* Tohoku University, Japan

ULTRA-WIDEBAND MULTISTATIC TRACKING OF HUMAN TARGETS
Yuan He, Pascal Aubry, François Le Chevalier
Delft University of Technology, the Netherlands

DYNAMIC POLARIMETRIC CALIBRATION USING A SINGLE DUAL-POLARIZED ANTENNA POLARIMETRIC ACTIVE RADAR CALIBRATOR
Y.Z. Li¹,², M. He¹,²*, J. Huang¹,², Y.J. Luo³ and S.P. Xiao¹,²
¹State Key Laboratory of Complex Electromagnetic Environment Effects on Electronics and Information System, China
² National University of Defense Technology, China
³Beijing Space Information Relay and Transmission Center, China

A TARGET EXTRACTION ALGORITHM BASED ON MULTIPLE THRESHOLDS IN THROUGH-WALL-IMAGING
Jiangang Liu, Lingjiang Kong, Xiaobo Yang and Yong Jia
University of Electronic Science and Technology of China

PRINCIPAL COMPONENT ANALYSIS AND AKAIKE INFORMATION CRITERION BASED IMAGE ENHANCEMENT FOR GROUND PENETRATING RADAR
Muhammad Mohsin Riaz and Abdul Ghafoor
National University of Sciences and Technology, Pakistan

WAVELET TRANSFORM AND SINGULAR VALUE DECOMPOSITION BASED CLUTTER REDUCTION FOR THROUGH WALL IMAGING
Muhammad Mohsin Riaz and Abdul Ghafoor
National University of Sciences and Technology, Pakistan

Session 11: Target Detection and Tracking
Time: 08:00-10:00, April 16, 2013 , Place: No.10 conference room
Chairs: Prof. Peter Willett, University of Connecticut, USA
Prof. Lan Du, Xidian University, China

DETECTION OF AIR MANEUVERING TARGETS BASED ON THE RECONSTRUCTION OF THE TARGET SIGNAL
Hai Li, Renbiao Wu, Xiaohan Wang, Jingzhong Zheng
Civil Aviation University of China

F0425 NEW PARAMETERS IN COMPACT POLARIMETRY FOR OCEAN TARGET DETECTION
J. J. Yin***, J. Yang*, Z-S Zhou**
* Tsinghua University, China
** CSIRO Mathematics, Informatics and Statistics, Australia

F0342 AN IMPROVED PARTICLE FILTER FOR DIM RADAR TARGET DETECTION AND TRACKING
Lu Jia¹, Ming Li¹, Lu Xing², Yan Wu¹, Wanying Song¹
¹ Xidian University, China
² Electronic Engineer Institute of Xi’an, China

D0119 IPIX RADAR SMALL TARGET DETECTION IN SEA CLUTTER BASED ON LOCAL BACKSCATTERING AMPLITUDE STATISTICS
Fuyou Wang, Ding Luo, Yaxin Ji, Xinmei Hu
AVIC Radar and Avionics Institute, China

D0497 PERFORMANCE OF DOUBLE THRESHOLD SWITCHING CFAR IN THE HOMOGENEOUS AND NON-HOMOGENEOUS ENVIRONMENTS
Saeed Erfanian*, Shima Faramrzi**
* Islamic Azad University, Iran
** Amirkabir University of Technology, Iran

D0176 Range-spread Target Detection in Homogenous Clutter via Short-time GLRT Estimation and HOCC Integration
Shu-wen Xu*, Peng-lang Shui
Xidian University, China

Session 12: Antenna and EM Technology
Time: 08:00-10:00, April 16, 2013, Place: No.8 conference room
Chairs: Prof. Tapan K. Sarkar, Syracuse University, USA
Dr. Sio Weng Ting, University of Macau, Macao, China

F0704 SIMULATIONS OF AIRBORNE PHASED ARRAY USING PARALLEL MOM
Yu Zhang*, Zhong-Chao Lin, Ze-Nan Yang, Wen-Hui Ge, Xun-Wang Zhao, Hui Zhao
Xidian University, China
E0215  DESIGN OF FREQUENCY-SCANNING ASYMMETRIC ANTIPODAL VIVALDI ANTENNA  
Zi-Jian Gao, Li-Ming Si, Yong Liu, Xin Lv  
Beijing Institute of Technology, China

E0316  A NOVEL BROADBAND BIONIC YAGI-UDA ANTENNA WITH LOW RADAR CROSS SECTION  
Jinyang Xue, Ying Liu, Wei Wang and Hu Liu  
Xidian University, China

F0329  RADIATION OF AN AIRBORNE PATCH ARRAY ANTENNA  
Ze-nan Yang¹, Shu-gang Jiang¹, Xun-wang Zhao*, Yu Zhang¹, Hui Qu²  
¹Xidian University, China  
²CAPF, China

E0696  SIMPLE SYSTEMATIC FREQUENCY RECONFIGURABLE MICROSTRIP PATCH ANTENNA  
Hossam Hamza¹, Biao Hou²  
¹,²Xidian University, China

E0444  ANALYSIS OF HORN ANTENNAS INCLUDING THE HORN TRANSITION INTO HALF SPACE EMPLOYING A FULL WAVE HYBRID TECHNIQUE  
Rajib Jana and Ratnajit Bhattacharjee  
Indian Institute of Technology (IIT), India

Session 13: SAR/ISAR Signal Processing  
Time: 10:20-12:00, April 16, 2013, Place: VIP room  
Chairs: Prof. Mihai Datcu, German Aerospace Center DLR, Germany  
Prof. Mengdao Xing, Xidian University, China

B0384  ROTATIONAL MOTION ESTIMATION FROM ISAR DATA USING FRAME PROCESSING STRUCTURE  
Ya Jing Huang¹ Xuezhi Wang¹ Xiang Li¹ and Bill Moran³  
¹National University of Defense Technology, China  
³University of Melbourne, Australia

B0553  A NEW ESTIMATION METHOD FOR SAR FREQUENCY DIFFERENCE DRIFT BASE ON FREQUENCY BAND SYNTHESIS  
Guangzuo Lee¹, Weidong Sun¹, Guangcai Sun², Sujuan Fang³, Mengdao Xing²  
¹Tsinghua University, China.  
²Xidian University, China.  
³Jiangnan Institute of Remote Sensing Application, China.
B0177  A NOVEL HIGH-RESOLUTION IMAGING METHOD FOR ROSAR
Wei Wang, Guisheng Liao, Dong Li, Ke Yang and Qing Xu
Xidian University, China.

B0318  OPTIMAL ISAR IMAGING TIME SELECTION OF SHIP TARGETS USING REAL DATA
Ning Li, Ling Wang, and Daiyin Zhu
Nanjing University of Aeronautics and Astronautics, China

B0129  HIGH RESOLUTION LASAR 3-D IMAGING BASED ON IAA ALGORITHM
Chen Cheng, Xiaoling Zhang, Wenjie Peng
University of Electronic Science and Technology of China

Session 14: New Technology of Radar
Time: 10:20-12:00, April 16, 2013, Place: No. 7 conference room
Chairs: Prof. Xianrong Wan, Wuhan University, China
Dr. Julien Le Kernec, University of Nottingham-Ningbo, China

D0188  LATEST VELOCITY ESTIMATION AND NORMALIZATION RESULT OF THE GROUND FORWARD SCATTER RADARSYSTEM
Xu Chunyang *
University of Birmingham, UK

G0251  DEVELOPMENT OF DISTRIBUTED APERTURE COHERENCE SYNTHETIC RADAR TECHNOLOGY
Gao Hong-Wei, Cao Zhe, Lu Yao-Bing, Wang Peng-Xiang
Beijing Institute of Radio Measurement, China

B0484  SUPPRESS CROSS-CORRELATION NOISE OF SAME FREQUENCY CODING ORTHOGONAL SIGNALS IN MIMO-SAR
Cangzhen Meng¹,³, Jia Xu¹², Shibao Peng¹, Jian Yang¹, Xiaojun Wang³, YingningPeng¹
¹Tsinghua University, China
² Beijing Institute of Technology, China
³ Early-Warning Academy of Airforce, China

G0719  JOINT SPARSE MODELING FOR TARGET PARAMETER ESTIMATION IN DISTRIBUTED MIMO RADAR
Tao Yu, Zhang Gong*, Ben De
Nanjing University of Aeronautics and Astronautics, China
Session 15: Interference and Clutter Suppression

Time: 10:20-12:00, April 16, 2013, Place: No.10 conference room

Chairs: Prof. Rick S. Blum, Lehigh University, USA
       Prof. Haihong Tao, Xidian University, China

D0090 COMPRESSIVE SENSING RADAR IMAGING WITH PERTURBATIONS
1 Nanjing University of Science and Technology, China
2 China Academy of Space Technology, China

D0731 WAVEFORM DESIGN FOR MIMO OVER-THE-HORIZON RADAR DETECTION IN SIGNAL DEPENDENT CLUTTER AND COLORED NOISE
Shuangling Wang, Qian He*, Zishu He, and Rick S. Blum†
*Univ. of Electron. Sci. and Tech. of China
† Lehigh University, USA

D0124 IMPACT OF PATTERN DISTORTION ON CLUTTER CANCELLER BEAMFORMER
T. Fickenscher*, A. Gupta, P. Ludwig, and B. Razza
Helmut Schmidt University
University of the Federal Armed Forces Hamburg, Germany

D0490 REPEAT JAMMING AGAINST LFM RADARS BASED ON SPECTRUM-DIVIDED
Pan Xiao-Yi*, Wang Wei, Feng De-Jun, Fu Qi-Xiang, Wang Guo-Yu
National University of Defense Technology, China

D0113 PERFORMANCE EVALUATION OF SSAP FOR CLUTTER REJECTION IN CP-OFDM SIGNAL BASED PASSIVE RADAR
Jianxin Yi, Xianrong Wan*, Zhixin Zhao, Feng Cheng, Hengyu Ke
Wuhan University, China

D0523 A RECURSIVE ALGORITHM FOR THE DESIGN OF ARRAY ANTENNA IN STAP APPLICATION
Zi-Yuan Xiong*, Zhen-Hai Xu, Liang Zhang, Shun-Ping Xiao
National University of Defense Technology, China

Session 16: Real Time Signal Processing

Time: 10:20-12:00, April 16, 2013, Place: No.8 conference room

Chairs: Prof. Leo P. Ligthart, Delft Universiteit of Technology, Netherlands
       Dr. Hao Chen, Natural Resources Canada, Canada
E0521 SPURIOUS COMPONENTS INTRODUCED BY NONLINEARITY IN DIRECT DIGITAL SYNTHESIS
H. Wang; C. Liu
Beijing Institute of Technology, China

D0257 PARALLEL IMPLEMENTATION OF HIGH RESOLUTION RADAR SIGNAL PROCESSING SYSTEM BASED ON MULTI-IC ARCHITECTURE
Xiang Hong¹, Wang Jun¹, Zhang Yuxi¹
Beihang University, China

D0271 PROCESSING OF SAR DATA BASED ON THE HETEROGENEOUS ARCHITECTURE OF GPU AND CPU
Ming-cong Song¹,², Ya-bo Liu², Feng-jun Zhao², Robert Wang², Hong-yu Li¹,²
¹University of Chinese Academy of Sciences, China
²Chinese Academy of Sciences, China

D0391 DETECTION OF FAST AIR MOVING DIN TARGETS VIA STAP WITH LOW COMPUTATION BURDEN
JIA QiongQiong*, WU RenBiao
Civil Aviation University of China

B0535 RESEACH ON THE MICROWAVE SNAPSHOT IMAGING RADAR BASED ON ANTENNA ARRAY
*Y.L. Qi¹,², X.L. Yang¹,²,³, W.X. Tan¹,², Y.P. Wang¹,², W. Hong¹,²
¹Science and Technology on Microwave Imaging Laboratory China;
²Chinese Academy of Sciences, China
³Graduate University of Chinese Academy of Sciences, China
Poster Session

Poster Session 1
Time: 15:50-16:30, April 15, 2013, Place: Corridor of 3rd floor

A0057  COMPARISON STUDY OF TWO APPROACHES FOR BIORADAR DATA PROCESSING
L.N. Anishchenko*, S.I. Ivashov, F. Soldovieri, Catapano, L. Crocco
Bauman Moscow State Technical University, Russia

A0065  HOLOGRAPHIC SUBSURFACE IMAGING RADAR FOR APPLICATIONS IN CIVIL ENGINEERING
*Bauman Moscow State Technical University, Russia
**Yildiz Technical University, Turkey

A0131  AERIAL FLIGHT CALIBRATION TEST OF PRECIPITATION RADAR
Chonghui Zhao*, Wei Xiang1, Danru Yu1, Zhiqiang Ge1, Zhaoyang Li1, Xiaobin Feng2
1Science and Technology on Millimeter-wave Laboratory;
2Beijing Institute of Environment Features

A0132  DESIGN OF NAVIGATION RADAR SIGNAL ACQUISITION AND ANALYSIS SYSTEM
Song Jie1,2, Long Teng1, He You2
1Beijing Institute of Technology, China
2Naval Aeronautical and Astronautical University, China

A0179  VELOCITY MEASUREMENT USING THE CHAOS RADAR WITH COHERENT RECEPTION
Shengmiao Zhang*, Jingfeng Hu, Zishu He
University of Electronic Science and Technology of China

A0290  MARINE RADAR ANTENNA HEIGHT DESIGN UNDER MULTI-PATH EFFECT
ZHANG Yang1,2, ZENG Hao5, WEI Yi-min3*, LIU Yu-jing3, YANG Chun-hua3
1Naval University of Engineering, China
2Unit 92857 of PLA, China
3SVA Communication Technology Co., Ltd.
A0324 DETECTION OF TREE ROOTS AND ROOT BIOMASS ESTIMATION BASED ON GROUND PENETRATING RADAR WITH HIGH ACCURACY POSITIONING SYSTEM
Shiping Zhu¹,², Yi Su¹ and Motoyuki Sato²
¹National University of Defense Technology, China;
²Tohoku University, Japan

A0446 A 79-GHZ LTCC RADAR FRONTEND USING A NONUNIFORM ARRAY WITH NON-IDENTICAL ELEMENTS
Xin Wang*, Christian Schmid, and Andreas Stelzer
Johannes Kepler University of Linz, Austria

A0615 A NEW METHOD OF MULTI-TARGET DETECTION FOR FMCW AUTOMOTIVE RADAR
Yuanzhang Fan*, Kai Xiang, Jianping An, Xiangyuan Bu
Beijing Institute of Technology, China

A0678 SYSTEM DESIGN AND ANALYSIS OF L-BAND APERTURE SYNTHESIS MICROWAVE RADIOMETER
Yinan Li¹, Hao Li¹, Ruiqing Liu²
¹Xi’an Institute of Space Radio Technology, China
²Xi’an International University, China

B0073 FOREST AND NON-FOREST DISCRIMINATION USING POLSAR DATA BASED ON K-WISHART DISTRIBUTION
Lan Li¹,², Zengyuan Li*, Erxue Chen¹, Chong Ren¹,²
¹Chinese Academy of Forestry, China,
²Xi’an University of Science and Technology, China

B0075 AUTOMATIC LOCAL THRESHOLDING ALGORITHM FOR SAR IMAGE EDGE DETECTION
Qian-Ru Wei*, Da-Zheng Feng, Ming-Dong Yuan
Xidian University, China

B0077 ENHANCEMENT IMAGING ON MULTI-PATH SIGNALS IN ULTRA-WIDEBAND RADAR
Zhejun Lu, Tian Jin, Zhimin Zhou
National University of Defense Technology, China

B0088 AN IMPROVED SHIFT-AND-CORRELATION (ISAC) ALGORITHM FOR DOPPLER RATE ESTIMATION BASED ON THE RADON TRANSFORM
Yufeng Wu*, Guangcai Sun, Xueshi Li, Mengdao Xing, Zheng Bao
Xidian University, China
B0089  ATOMIC DECOMPOSITION-BASED SAR IMAGING  
Yesheng Gao, Kaizhi Wang and Xingzhao Liu  
Shanghai Jiao Tong University

B0092  SPARSE ARRAY SAR 3-D IMAGING USING COMPRESSED SENSING  
Shun-Jun Wei, Xiao-Ling Zhang, Jun Shi  
University of Electronic Science and Technology of China

B0106  SAR ECHO SIMULATION FROM NUMEROUS SCATTERING CELLS BASED ON GPU  
Hui Sheng, Ming Zhou, Kaizhi Wang, Xingzhao Liu  
Shanghai Jiao Tong University, China

B0107  STUDY ON ALONG-TRACK MOTION COMPENSATION FOR FMCW SAR  
Jia Gaowei, Chang Wenge  
National University of Defense Technology, China

B0108  AZIMUTH RESOLUTION IMPROVEMENT OF SPACEBORNE SAR IMAGES WITH NEARLY NONOVERLAPPED DOPPLER BANDWIDTH  
Yan-Yang Liu, Zhen-Fang Li, Zhi-Yong Suo, Zheng Bao  
Xidian Univ., China

B0109  A NOVEL IMAGING ALGORITHM FOR CIRCULAR SCANNING SAR BASED ON THE CARdDANO'S FORMULA  
Yi Liao*, Shuangxi Zhang, Gang Xu, Mengdao Xing  
Xidian University, China

B0111  A RESEARCH ON SAR AUTOFOCUSING ALGORITHMS FOR COMPRESSIVE SENSING TECHNIQUE  
Linuo Xia, Daiyin Zhu and Rui Jiang  
Nanjing University of Aeronautics and Astronautics, China

B0116  ROBUST HIGH-RESOLUTION AND WIDE-SWATH SAR IMAGING BASED ON TOPELITZ PREPROCESSING  
Wang Guang  
Xi’an University of Arts and Science, China

B0125  3-D IMAGING METHOD FOR ROSAR  
Ke Yang, Guisheng Liao, Wei Wang, Qing Xu, and Dong Li  
Xidian University, China
B0130  BISTATIC ISAR IMAGE FUSION WITH SUB-APERTURE BASED PARAMETER ESTIMATION  
Ran Xu*, Peng Shao, Yachao Li, Mengdao Xing  
Xidian University, China

B0144  CROSS-RANGE SCALING COMBINING MOTION COMPENSATION FOR ISAR IMAGING  
Jialian Sheng*, Jia Duan, Mengdao Xing, Lei Zhang  
Xidian University, China

B0151  A NEW APPROACH FOR RADAR ECHO SIMULATION OF TARGETS BASED ON HIGH PRECISION MOTION CHARACTERISTICS  
Li Tao, XUE Wei-min, LIU Tian-song  
EAAF, Beijing, China

B0158  A FULL-APERTURE IMAGING ALGORITHM FOR HYBRID SLIDING SPOTLIGHT BISTATIC SAR  
F. Zhou*, G.C. Sun, M.D. Xing, J. Yang  
Xidian University, China

B0161  SYNTHETIC APERTURE RADAR PROCESSING USING A NOVEL IMPLEMENTATION OF FAST FACTORIZED BACK-PROJECTION  
H. L. Li*, J. Li, Y. X. Hou, L. Zhang, M. D. Xing, Z. Bao  
Xidian University, China

B0166  A NOVEL 3D VISUALIZATION METHOD OF SAR DATA  
Yiming Lin, Fan Zhang*, Wei Hu  
Beijing University of Chemical Technology, China

B0174  FARADAY ROTATION ANGLE ESTIMATION FROM POLARIMETRIC COVARIANCE MATRIX  
Li Li*, Yongsheng Zhang, Lin Yang, Zhen Dong  
National University of Defense Technology, China

B0175  A COMBINED MODE OF TOPS AND INVERSE TOPS FOR MECHANICAL BEAM STEERING SPACE-BORNE SAR  
Qi Chen*, Haifeng Huang, Feng He, Zhen Dong, Diannong Liang  
National University of Defense Technology, China

B0184  GEOMETRY CORRECTION METHOD FOR BISTATIC SPACEBORNE/STATIONARY SAR  
Rui Wang, Feng Li, Cheng Hu and Tao Zeng  
Beijing Institute of Technology, China
B0185 MODIFIED SUB-INTEGER RANGE ALIGNMENT BASED ON MINIMUM
ENTROPY FOR ISAR
Wang Rui*, Li Feng* and Zeng Tao*
Beijing Institute of Technology, China

B0194 ULTRA WIDE SWATH SAR BASED ON WAVEFORM DIVERSITY
Zhang Yan*, Yu Ze, Li Chunsheng
Beihang University, China

B0208 LANDMINE DETECTION BASED ON MORPHOLOGICAL COMPONENT
ANALYSIS
Yuming Wang*, Qian Song, Hanhua Zhang, Xiaotao Huang, Tian Jin
National University of Defense Technology, China

B0236 SAR IMAGE PREPROCESSING BASED ON THE CFAR AND ROA ALGORITHM
LI Jun-xia*, CHEN He
Beijing Institute of Technology, China

B0242 EFFECTS OF IONOSPHERIC HIGH-ORDER DISPERSION AND MULTIPLE
SCATTERING ON SPACE-BASED SAR IMAGING
Cheng WANG*1, Zheng-Wen XU*2, Min ZHANG*3, Chun CHEN*4
1Xidian University, China,
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B0263 STUDY ON THE IMPACT OF POLARIZATION ON FOREST PARAMETERS
RETRIEVAL OF POLINSAR
LiYing Xu*, ShiQiang Li, WeiDong Yu, Robert Wang
Chinese Academy of Sciences, China

B0283 THE ANALYSIS OF DISPERSIVE DISTORTIONS ON LINEAR POLARIZATION
RADAR SIGNAL
ChenChun*, Ding Zonghua, Wang cheng
China Research Institute of Radiowave Propagation

B0291 RESEARCH ON FORWARD-LOOKING SYNTHETIC APERTURE RADAR
IMAGING ALGORITHM OF HIGH VELOCITY PLATFORM
PANG Bo*, XING shi-qi, DAI Da-hai, LI Yong-Zhen, WANG Xue-song
National University of Defense Technology, China

B0294 CIRCULAR SAR MOTION COMPENSATION USING TRILATERATION AND
PHASE CORRECTION
Z. Y. Guo1, 2*, Y. Lin2, W. X. Tan2, Y. P. Wang2, W. Hong2
1Graduate University of the Chinese Academy of Sciences, China;
2Chinese Academy of Sciences, China
B0296 CHARACTERIZATION OF LEVEL SEA-ICE THICKNESS IN THE LABRADOR SEA USING C-BAND POLARIMETRIC SAR DATA
Meijie Liu¹,²,³, Yongshou Dai¹, Jie Zhang², Xi Zhang², Junmin Meng²
¹China University of Petroleum (Huadong), China,
²First Institute of Oceanography, State Oceanic Administration (SOA), China,
³Qingdao University, China

B0353 ANTENNA AREA CONSTRAINT in GEO SAR
Xichao Dong, Cheng Hu*, Tao Zeng
Beijing Institute of Technology, China

B0438 RESEARCH ON METHOD OF FLAT EARTH EFFECT REMOVAL BASED ON REFINED LOCAL FRINGE FREQUENCY
LIN Chun-yan, CHEN Liang*, GE Shi-qi
Beijing Institute of Technology, China

B0447 AN OPTIMAL BEAM POSITION COMBINATION METHOD IN SCANSAR
Li Yan, Zhang qinjun, Liu Jiuli
Beijing Institute of Spacecraft System Engineering, China

B0495 SPACE-BORNE SPOTLIGHT SAR INTERFEROMETRY PROCESSING
Yuanhao Li¹, Cheng Hu¹*, Teng Long¹, Chong Ni²
¹Beijing Institute of Technology, China,
²Beijing Institute of Spacecraft System Engineering, China

B0576 RANGE AMBIGUITY SUPPRESSION BY AZIMUTH PHASE CODING IN MULTICHANNEL SAR SYSTEMS
Jun Yang*, Guangcai Sun, Yufeng Wu, Mengdao Xing
XiDian University, China

B0670 A NON-LOCAL DESPECKLING APPROACH USING PIXEL-SIMILARITY THRESHOLDING
Li Guangting*, Dang Hongxing, Tan Xiaomin, and He Yapeng
Academy of Space Electronic Information Technology, China

B0694 ISAR IMAGING OF SPACE OBJECTS BASED ON STEPPED FREQUENCY MODULATION
Xiaoyan Bian, Xiongkui Zhang *, Yingmin Ma, Yingjie Zhang, Lizhi Zhao
Beijing Institute of Technology

B0746 SPACE DEBRIS NARROWBAND IMAGING VIA GENERAL RADON TRANSFORM IN REASSIGNED SPECTROGRAM
B. Yuan, Z. P. Chen, and W. C. Zhang
University of Defense Technology, China
D0511 RESEARCH ON SOFTWARE CACHE APPLIED TO THE GEOMETRIC CORRECTION OF SAR IMAGES
GAO Lining*, XIE Xiaosong*, MA Xiao*
Beijing Institute of Technology, China

D0549 CACHE-OPTIMIZED IMPLEMENTION OF LONG SEQUENCES FFT ON TS201
GAO Lining1, MA Xiao1, YUAN Yuan2, PANG Fengqian1
1Beijing Institute of Technology, China
2The Chinese People’s Liberation Army

D0552 GRATING LOBES SUPPRESSION TECHNIQUE IN STEPPED CHIRP RADAR
Shuang Xu, Weiming Tian*, Lin Sun, Di Yao, Tao Zeng
Beijing Institute of Technology, China

D0583 DIRECT DIGITAL GENERATION OF ULTRA-WIDEBAND LFM SIGNAL AND ITS COMPENSATION TECHNOLOGY
SHENG Mengmeng, LIU Haibo, WANG Junfu, JIAO Jiang
Beijing Institute of Technology, China

D0585 STATISTICAL RESOLUTION LIMIT BASED ON Cramer-Rao Bound
Dinghong Lu, Yang Li *, Chaojie Liang
Beijing Institute of Technology, China

Poster Session 2
Time: 15:50-16:30, April 15, 2013, Place: Corridor of 5th floor

B0323 ANALYSIS AND CORRECTION OF THE DOPPLER FREQUENCY SHIFT OF AIRBORNE FORWARD LOOKING ARRAY FMCW SAR
Yingjie ZHANG*1,2, WeiXian TAN1, YanPing WANG2, Wen HONG1
1Chinese Academy of Sciences, China
2 University of Chinese Academy of Sciences, China

B0370 CONSIDERATIONS OF SPACEBORNE SAR SYSTEM DESIGN
Zhao liangbo, Liu jie, Zhao changjiang, Wang zhenxing
China Academy of Space Technology, China

B0378 PHASE ERROR ANALYSIS IN GEO SAR IMAGING BASED ON MSR
Dexin Li*, Zaoyu Sun, Feng He, Zhen Dong, Diannong Liang
National University of Defense Technology, China

B0381 RFI SUPPRESSION ALGORITHM BASED ON MEDIAN FILTER FOR SAR DATA
Tengfei Zhao*, Yongsheng Zhang, Lin Yang, Zhen Dong
National University of Defense Technology, China
B0403  A NOVEL CAEMD FILTERING ALGORITHM FOR SAR IMAGE SPECKLE NOISE
S.Q.Huang*, D.Z.Liu, H.You, B.Ge
Xi’an Research Institute of Hi-Tech, China

B0467  SENSITIVITY ANALYSIS OF ALONG-TRACK INTERFEROMETRIC SYNTHETIC
APERTURE RADAR (ATI-SAR) IN THE PRESENCE OF SQUINT
Zhang Hui1,2,3,*, Hong Jun2,4
1University of Chinese Academy of Sciences, China
2Chinese Academy of Sciences, China
3Key Laboratory of Technology in Geo-Spatial Information Processing and Application
System Technology, China
4Science and Technology on Microwave Imaging Laboratory, China

B0516  THREE-DIMENSIONAL ISAR IMAGING USING HIGH RESOLUTION RANGE
PROFILES
Huipeng Zhao, Xiongjun Fu, Yingjie Zhang, Meiguo Gao
Beijing Institute of Technology, China

B0581  EFFECT OF SATELLITE ATTITUDE ERRORS ON SPOTLIGHT SAR IMAGE
Qi Yalin, Zhang qinjun, Guo jiajia
Beijing Institute of Spacecraft System Engineering, China

B0662  MODIFIED HYBRID DIGITAL CORRELATION ALGORITHM FOR HIGHLY
SQUINT SAR IMAGE FORMATION
Zengliang Li, Xin Zhao
Beijing Institute of Electrical and Mechanical, China

B0692  DESIGN AND SIMULATION OF ONE DIMENSIONAL FREQUENCY-DOMAIN
ALGORITHM BASED ON FPGA
Xu Yinhui1, Zeng Dazhi2, Zhao Hong, Wu Xinming
Beijing Institute of Technology, China

B0701  IMAGING OF SPACE TARGETS IN FMCW-ISAR
W. Chang *, Z. Li, K. Jin, J. Yang
Tsinghua University, China

B0711  GROUND-BASED SAR IMAGING BASED ON IMPROVED RANGE-DOPPLER
ALGORITHM
Jun Zhang*, Zhijun Pei
Tianjin University of Technology and Education, China

B0747  ROTATIONAL MOTION COMPENSATION FOR WIDE-ANGLE ISAR IMAGING
BASED ON INTEGRATED CUBIC PHASE FUNCTION
W. C. Zhang, Z. P. Chen, and B. Yuan
National University of Defense Technology, China
C0146 ESTABLISHMENT AND ANALYSIS OF ACCURATE SIGNAL MODEL FOR FORWARD-LOOKING IMAGING RADAR WITH MOTION PLATFORM
Lin Chao, Huang Yulin, Yang Jianyu
University of Electronic Science and Technology of China

C0239 A STUDY ON COMPENSATION OF APERTURE FILL TIME BASED ON FREQUENCY-SHIFTING
Zhu Xinguo, Zhang Kai
Nanjing Research Institute of Electronics Technology, China

C0276 PHASED ARRAY RADAR BEAMFORMING METHOD BASED ON MIMO RADAR COVARIANCE
A.S. Roshanzamir*, M.H. Bastani
Sharif University of Technology, Iran

C0302 HYBRID ORTHOGONAL-PHASED ARRAY MIMO RADAR
A.S. Roshanzamir*, M.H. Bastani
Sharif University of Technology, Iran

C0421 RECEIVERS’ PLACEMENT OF A MIMO RADAR IN THE PRESENCE OF MOUNTAINS
M. Nazari Majd, E. Bahrololoom, M.M. Chitgarha, M. Radmard and M.M. Nayebi*
Sharif University of Technology, Iran

C0487 STATUS IN U.S. AESA FIGHTER RADAR AND DEVELOPMENT TRENDS
Wang Yue Cao Lanying
AVIC Radar and Avionics Institute, China

C0540 RESEARCH ON ANTENNA STABILIZATION TECHNOLOGY OF MICRO SAR SYSTEM
Lin Sun, Di Yao*, Wei-ming Tian, Tao Zeng
Beijing Institute of technology, China

C0591 ANALYSIS OF SNR LOSS FOR PASSIVE COHERENT LOCATION RADAR
JIN Wei*1,2 Xiaode1, XIANG Maosheng1
1 Chinese Academy of Sciences,
2 Graduate University of Chinese Academy of Sciences, China

C0660 A DISPOSITION ALGORITHM FOR RADAR NETTING
Feng chunling, Wang guanhua, He kefeng
AVIC Radar and Avionics Institute, China
RESEARCH OF HIGH-SPEED RADAR SIGNAL PROCESSING SYSTEM BASED ON OPENVPX STANDARD
YUAN Yuan¹, MA Xiao², GAO Lining², XIE Xiaosong²
¹Troops of 96630, The Chinese People’s Liberation Army
²Beijing Institute of Technology, China

RESEARCH OF THE PULSE COMPRESSION METHOD FOR HIGH POWER AND SHORT DURATION PULSE RADAR
Jing Sun¹,², Jinyong Fang¹, She Shang¹
¹Science and Technology on Space Microwave Laboratory
²Northwestern Polytechnic University, China

DESIGN OF A HIGH-PERFORMANCE BALANCED FREQUENCY TRIPLER AT 94GHz
Xiaoyang Zhang, Hongxi Yu, Hui Xu, You Lv
China Academy of Space Technology, China

SCALE CHARACTERISTIC OF SEA SURFACE BACKSCATTERING ECHO
ZHOU Qiang, YANG Jian, QU Changwen, LIU Ning-Bo
Naval Aeronautical and Astronautical University, China

RESEARCH ON IMPLEMENTATION OF ELEMENTARY SYMMETRIC FUNCTION IN GM-CPHD FILTER
Shicang Zhang¹,², Jianxun Li¹ and Liangbin Wu²
¹Shanghai Jiao Tong University, China
²AVIC Radar and Avionics Institute, China

MULTIPLE MANOEUVRING TARGETS TRACKING VIA GM-PHD AND IMM-SB/MHT
Shicang Zhang¹,², Jianxun Li¹ and Liangbin Wu²
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²AVIC Radar and Avionics Institute, China

CRB OF TARGET LOCATION AND VELOCITY ESTIMATION IN MIMO RADAR
Chao Shuyuan
Shanghai Radio Equipment Research Institute, China

ANALYSIS OF CLUTTER CHARACTERISTICS OF INTEGRATED SENSOR IS STRUCTURE
Zhang Xinmiao
No.38 Research Institute of Chinese Electronic Technology Group Company, China
D0068  EFFECT OF TEMPORAL VARIATION IN TROPOSPHERIC REFRACTIVE INDEX ON GEOCSAR IMAGING  
Leilei Kou¹, Maosheng Xiang², and Xiaqing Wang²  
¹Nanjing University of Information Science and Technology, China;  
²Institute of electronics, Chinese Academy of Science, China

D0069  ADAPTIVE RADAR DETECTION FOR TARGETS IN COMPOUND-GAUSSIAN CLUTTER WITH INVERSEGAMMA TEXTURE  
Yi-nan Zhao, Xiao-yu Pang, Bin Yin  
Harbin Institute of Technology, China

D0076  DYNAMIC PROGRAMMING ALGORITHM FOR THE DETECTION OF AIR DIM TARGET  
Shi Changhai*, Luo Ding, Deng Xiaobo  
Radar and Avionics Institute of AVIC, China

D0078  ESTIMATING RADIAL VELOCITY FOR GROUND MOVING TARGETS FROM MULTI-CHANNEL SAR BY SPECTRAL ESTIMATION  
WEN Jun, BAO Min, Shi Lin  
Xidian University, China

D0083  DIFFERENCE PATTERN SYNTHESIS THROUGH ADDING FICTITIOUS JAMMERS  
Di, Hu Yangke, Li Feng*  
Beijing Institute of Technology, China

D0086  TWO-DIMENSIONAL CHIRP Z-TRANSFORM ALGORITHM TO THE RANGE-DEPENDENCE PROBLEM FOR FORWARD LOOKING AIRBORNE RADAR  
Yi Qu, Hong Xia guo Engineering  
University of Armed Police Force, China

D0093  COHERENT RADON TRANSFORM BASED WEAK TARGET DETECTION FOR PHASED ARRAY RADAR  
Lixiao Zhan*, Ziyue Tang, Zhenbo Zhu  
Department of Air/Space Early Warning Equipment, AFEWA, China

D0095  A BAYESIAN METHOD FOR WEAK TARGET TRACKING AIDED BY STRONG TARGET  
Tao Zeng¹, Chunxia Li¹, Xinliang Chen*, Yang Li¹, Xin Guo²  
Beijing Institute of Technology, China

D0104  HIGH-CAPACITY MATRIX ACCESS RESEARCH BASED ON C6678  
Jin Ye, Tan Qingqing, Li Man, Xu Guanghui  
Beijing Institute of technology, China
D0110 BANDWIDTH SYNTHEIS FOR STEPPED CHIRP SIGNAL: A MULTICHANNEL SAMPLING PROSPECTIVE
Yanhua Wang
The State University of New York, USA

D0118 SEA CLUTTER SIMULATION BASED ON SEA SURFACE MODEL AND TWO-SCALE SCATTERING MODEL
ZHU Ming-bo1, ZOU Jian-wu1, DONG Wei2, LI Xiang-ping1
Naval Aeronautical and Astronautical University, China
Air Traffic Control Equipment Maintenance Center of Navy, China

D0128 BASED ON MINIMUM-ENTROPY HRWS SAR CHANNEL-CALIBRATION METHOD
Shuangxi Zhang*, Guo Rui, Letian Zeng, and Mengdao Xing
Xidian University, China

D0134 ADAPTIVE WAVEFORM AND SAMPLING INTERVAL TRACKING BASED ON ESTIMATION ACCURACY FOR DOPPLER RADAR
T. Cheng*, D. Q. Zou, Z. S. He
University of Electronic Science and Technology, China

D0138 A METHOD OF CONTROLLING GATING LOBES BASED ON SPECTRA SYNTHESIS ALGORITHM
Chengfa Xu, Chengcheng Li, Yingmin Ma
Beijing Institute of Technology, China

D0141 ESTIMATION OF INITIAL PHASE OFFSET IN REAL-TIME FOR AIRBORNE DUAL-ANTENNA INSAR SYSTEM
Li-fu CHEN*,1,2, Wen-biao XIE1, Ya-fei HUANG1
1Changsha University of Science & Technology, China
2National University of Defense Technology, China

D0155 AN IMPROVED METHOD FOR SAR IMAGE COASTLINE DETECTION BASED ON DESPECKLING AND SVM
Guangzhou Qu1, 2
1Wuhan University, China
2Beijing Electro-Mechanical Engineering Institute, China

D0156 HIGH PERFORMANCE LOCAL-TEXTURE-INFORMATION WEIGHTED SAR TEMPLATEIMAGEMATCHING
Qiuze Yu*, Yufan Wang, Yan Zhang
Shanghai Jiaotong University, China
D0160  MICROWAVE STARING IMAGING BASED ON BJORCK-SCHMIDT ORTHOGONLIZATION
P. Shao*, R. Xu, H. L. Li, Y. C. Li, M. D. Xing
Xidian University, China

D0169  SIGNAL COHERENT PROCESSING METHODS OF MIMO RADAR BASED ON RFT
JIN Zhen, WEN Shu-liang, XIAO Xian-jie
Beijing Institute of Radio Measurement, China

D0178  PIECEWISE ADAPTIVE BEAMFORMING METHOD WITH MULTIPLE CONSTRAINTS FOR OTHR
Zheng Bao*, Jian-wen Chen
Key Research Lab of Wuhan Early Warning Institute, China

D0191  RESEARCH ON MONO-PULSE FORWARD-LOOKING IMAGING AIRBORNE RADAR SYSTEM
ZHANG Xiaojing*, HE Min, HE Zhiyi, SU Hongyan, ZHANG Jun
Beijing Institute of Remote Sensing Equipment

D0193  REASEARCH ON PARALLEL DEBUGGER IN BUS-BASED MULTI-DSP SYSTEM IN RADAR DATA PROCESSING
Man Li, Qing-qing Tan, Ye Jin, Hong-zhu Guo
Beijing Institute of Technology, China

D0200  RESEARCH OF EFFECTIVE SCHEDULING STRATEGY ON IMPLEMENTING HIGH SPEED SERIAL TRANSMISSION SWITCH MODULE
Wang Jing-hua¹, Jinye²*, Liyan¹
¹ China Academy of Space Technology, China
² Beijing Institute of Technology, China

D0201  SAR IMAGE TARGET DETECTION BASED ON MULTISCALE AUTO-CONVOLUTION VARIANCE SALIENCY
WANG Guo-li*, ZHOU Wei, YAO Li-bo, GUAN Jian
Naval Aeronautical and Astronautical University, China

D0202  IMPROVED CAPON BEAMFORMING ALGORITHM BY USING INVERSE COVARIANCE MATRIX CALCULATION
Weiheng Chen¹, Yihuan Zhao¹,², Jing Gao¹,²
¹ Luoyang Optoelectro Technology Development Center, China
² Aviation Key Laboratory of Science and Technology on Airborne Guided Weapons, China
D0206 GPU ACCELERATION OF RANGE ALIGNMENT BASED ON MINIMUM ENTRPY CRITERION
Shi Xin-Liang, Xie Xiao-Chun*
Gannan Normal University, China

D0210 STUDY ON SEARCH PERFORMANCE OF SUBARRAY MULTI-CHANNEL PHASED ARRAY RADAR BASED ON MULTIPLE RECEIVED BEAMS
LI Yang *, LV Hui-hui *, Sun Peng, Zhang Xin-yu
Beijing Institute of Technology, China

D0212 MOVING TARGET TRACK DETECTION IN RADAR LOW ANGLE ENVIRONMENT
He Jiayi, Liao Guisheng, Yang Zhiwei
Xidian University, China

D0217 RADAR ECHO SIMULATION CAPABILITY INCORPORATED INTO SIGNAL PROCESSOR
Yongbin Hong, Chengfa Xu*, Jiang Yan, Guojie Qin
Beijing Institute of Technology, China

D0224 A MICRO-DOPPLER FREQUENCY ESTIMATION METHOD FOR MICRO-MOTION OBJECT USING TVAR MODEL
Han Xun*, Du Lan*, Liu Hongwei, Shao Changyu, Wang Baoshuai
Xidian University, China

D0227 BATCH INITIATION USING WEIGHTED LEAST SQUARE ALGORITHM FOR TACTICAL BALLISTIC MISSILE TRACKING
Yonghua Tian, Yanling Jia, Yong Huang
Beijing Institute of Radio Measurement, China

D0228 RESEARCH AND IMPLEMENTATION OF CTM FOR REAL-TIME SAR IMAGING PROCESSING
Xiaoning Liu, He Chen*, Yizhuang Xie
Beijing Institute of Technology, China

D0233 AN EFFICIENT DESIGN OF HIGH-ACCURACY AND LOW-COST FFT
Ma Cuimei, Chen He*, Ma Long
Beijing Institute of Technology, China

D0234 TARGET TRACKING WITH INFRARED IMAGING AND MILLIMETRE-WAVE RADAR SENSOR
ZHANG Xuejing 1, 2, MA Long 1, CHEN He 1,*, YANG Jing 2
1Beijing Institute of Technology, China
2Beijing Union University, China
D0235  TIME-SHARED FITTING METHOD OF DOPPLER PARAMETERS AND THE IMPLEMENTATION ON FPGA  
Wen Yan†, He Chen*  
†Beijing Institute of Technology, China  
*Beijing Institute of Technology, China

D0238  MOTION COMPENSATION FOR MISSILE-BORNE FREQUENCY STEPPED CHIRP RADAR  
BO LIU*, WENGE CHANG  
National University of Defense Technology, China

D0247  THE PERFORMANCE ANALYSIS OF MICRO-DOPPLER EXTRACTED FROM RADAR ECHOES UNDER DIFFERENT BANDWIDTH  
Lumin Shi, Xiongjun Fu, Cai Wang, Ting Li, Meigu Gao  
Beijing Institute of Technology, China

D0248  RESEARCH ON MEASUREMENT ALGORITHM OF VECTOR MISS DISTANCE BASED ON IMPULSE RADAR  
Yuxiang Zhou, Haibo Liu*, Xiaoying Deng  
Beijing Institute of Technology, China

D0261  A NOVEL DESIGN OF PARALLEL AND HIGH-SPEED SIGNAL PROCESSOR ARCHITECTURE FOR PD RADAR  
Yuan Changshun³, Wang Jun¹, Bi Yanxian¹, Zhang Yuxian²  
¹Beihang University, China  
²Automatic Control and Computer Simulation Liaoning, China

D0272  AN ULTRA-HIGH SPEED SAR RAW DATA RECORDING AND PLAYBACK SYSTEM BASED ON NAND FLASH  
Guojie Qin¹, Min Xie¹, Guoman Liu¹, Peng Xu²  
¹School of Information and Electronics  
²Beijing Institute of Technology, China

D0287  AN ESTIMATION APPROACH FOR EQUIVALENT WALL PARAMETERS IN THROUGH-WALL-RADAR IMAGING  
Zhongxing Zhao, Lingjiang Kong*, Yong Jia, Jiangang Liu  
University of Electronic and Technology of China

D0288  COMPENSATION METHOD FOR INTENSITY DIFFERENCE OF WALL IMAGES  
Zhixi Li, Lingjiang Kong, Yong Jia, Jing Ma  
University of Electronic Science and Technology of China
D0297 A NOVEL PARTICLE FILTER FOR TARGET TRACKING IN WIRELESS SENSOR NETWORK
Gang Lu*1,2, Wei Zhao1, Jinping Sun1, Shuqin Sun3, Shiyi Mao1
*1Beihang University, China
2Naval Aeronautical Engineering Institute, China,
3Beijing Institute of Control and Electronic Technology, China

D0311 A METHOD FOR EXTRACTING RADAR WORDS OF MULTI-FUNCTION RADAR AT DATA LEVEL
LI Cheng *, WANG Wei, WANG Xuesong
National University of Defense Technology, China

D0326 RADAR ASSIGNMENT FOR STEALTH TARGETS DETECTION AND TRACKING BASED ON BPSO IN AIR-DEFENSE RADAR NETWORK
Xidian Univ., China

D0344 PARAMETER ESTIMATION OF LFM SIGNAL VIA COMPRESSIVE SENSING
Zha Song, Liu Peiguo and Huang Jijun
National University of Defense Technology, China

D0348 RESOLVING TARGETS USING SPACE-TIME SNAPSHOT BASED ON GLRT ALGORITHM
Dinghong Lu, Yang Li *, Chaojie Liang
Being Institute of Technology, China

D0349 ADAPTIVE CANCELLATION OF DIRECT WAVE INTERFERENCE BASED ON A NEW VARIABLE-STEP-SIZE NLMS ALGORITHM
Song Jie1,2, Long Teng1, He You2
1Beijing Institute of Technology, China
2Naval Aeronautical and Astronautical University, China

D0386 ONE METHOD AND REALIZATION OF REAL-TIME CALCULATING PHASE FACTOR OF CHIRP SCALING ALGORITHM
Wang Lin, Chen Liang*, Xu Shenghao, Long Teng
Being Institute of Technology, China

D0392 GPU-ACCELERATED 3D COMPRESSIVE SENSING CSAR IMAGING
Lingjuan Yu1, Guanghua Huang2, Xiaochun Xie3
1Jiangxi University of Science and Technology, China,
2Gannan Normal University Institute of Science and Technology, China,
3Gannan Normal University, China
D0394 SIGNAL MODULATION CHARACTERISTIC ANALYSIS BASED ON SFFT-HAAR ALGORITHM
W. Liu *, X. Zhang
Being Institute of Technology, China

D0400 A PARAMETRIC SPECTRAL MOMENTS ESTIMATION ALGORITHM BASED ON FITTING AUTOCORRELATION SEQUENCE
Xiaoguang Lu*, **, Renbiao Wu**, Juan Qin*
* Tianjin University, China
** Civil Aviation University of China, China

D0402 A NOVEL PARTICLE FILTERING ALGORITHM BASED ON STATE FUSION
H.B. Yu*, G.H. Wang, Q. Cao, Y. Sun
Naval Aeronautical and Astronautical University, China

D0410 A MICRO-MOTION MEASUREMENT METHOD BASED ON WIDEBAND RADAR PHASE DERIVED RANGING
Fan Hua-yu, Ren Li-xiang*, Mao Er-ke
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D0436 ANALYSIS OF PRIMARY PARAMETERS ESTIMATION WITH SPACE TIME PROCESSING IN
Zhou Chao¹, Zhu Can Yan*, Hu Cheng², Liu Xiang Rong³
¹ Soochow University, China
² Beijing Institute of Technology, China
³ National Key Laboratory of Science and Technology on Test Physics & Numerical Mathematical, China

D0450 HIGH ACCURACY SIGNAL SIMULATION OF SSBSAR SYSTEM WITH NAVIGATION SATELLITE
Hanwei Sun¹*, Cheng Hu², Tao Zeng²
¹ Tsinghua University, China
² Beijing Institute of Technology, China

D0458 THE STUDY OF MONO-PULSE ANGLE MEASUREMENT BASED ON DIGITAL ARRAY RADAR
Liu Haibo, Yang Xiaoqian, Jiang Han, ShengMengmeng
Beijing Institute of Technology, China

D0463 A METHOD OF ACHIEVING HIGH PRECISION TIME DELAY IN SUBARRAY STRETCH PROCESSING
Honggang Zhang, Jingchao Chen, Quanhua Liu*
Being Institute of Technology, China
D0464 COMPRESSIVE SENSING TECHNIQUE FOR THROUGH-WALL-RADAR IMAGING
Zhao Weieivi, Zhou Ruixuevi, Liu Feifengvi,* Hu Chengvi
1Airforce Military Representative Office in GanSu
2Beijing Institute of Technology, China

D0466 DETECTION OF RANGE SPREAD TARGET WITH COHERENT INTEGRATION
Li Wang, Xinliang Chenvi*
Being Institute of Technology, China

D0471 DOPPLER AMBIGUITY CORRECTION USING ENERGY ACCUMULATION
Xiaofei Luvi*, Xinliang Chenvi*, Xingbin Huangvi*, Xiaoming Zhao
Being Institute of Technology, China

D0479 AN IMPLEMENTATION OF FFT PROCESSOR
Xing Sun, Dongli Qiu, He Chenvi *, Dong Chen
Being Institute of Technology, China

D0500 TRACK-BEFORE-DETECT OF WEAK BALLISTIC TARGET USING ELLIPTICAL HOUGH TRANSFORM
Bin Raoii1,2 *, Zhi-Wei Zongi1,2, YuanPing Niei1,2
1State Key Laboratory of Complex Electromagnetic Environment Effects on Electronics and Information System, China,
2National University of Defense Technology, China

D0502 FPGA IMPLEMENTATION OF DIGITAL LOCAL OSCILLATOR FOR DIGITAL STRETCH PROCESSING
Yuan Jiang, Qingdan Luo, Quanhua Liiu*
Beijing Institute of Technology, China

D0524 THE OPTIMAL LCMV BEAMFORMER UNDER MULTIPLE DESIRED SIGNALS CASE
Zhen-Hai Xuii1,2*, Ming-Zui Cheni1,2i, Bin Raoii1,2
1State Key Laboratory of Complex Electromagnetic Environment Effects on Electronics and Information System, China
2National University of Defense Technology, China

D0539 AN APPROACH TO MANIFOLD ESTIMATION FOR ANTENNA ARRAY IN SITUATION OF INTERFERENCES
Qun Wanii1, Bao Gen Xuii2, Fang Fangii, Yi He Wanii2, Si Long Tangii2
1University of Electronic Science and Technology of China, China
2Tongfang Electronic Science and Technology Limited Company, China
D0587 DESIGN AND IMPLEMENTATION OF MODULATED STEPPED FREQUENCY RADAR SIGNAL
WANG Junfu, LIU Haibo, NIU Yang, Zhang Weitao
Beijing Institute of Technology, China

D0598 PULSE JAMMING SUPPRESSION FOR AIRBORNE RADAR BASED ON JOINT TIME-FREQUENCY ANALYSIS
Fang Yuan Li1, 3, Jia Xu1, 2, Xu Dong ZHANG1
1Tsinghua University, China
2Beijing Institute of Technology, China
3Naval Aeronautical and Astronautical University, China

D0619 MULTIFRACTAL MODELING OF AIRCRAFT ECHOES FROM LOW-RESOLUTION RADARS
Li Qiusheng1, 2, Xie Weixin1
1Shenzhen University, China
2Gannan Normal University, China

F0752 DESIGN OF DATA TRANSMISSION SYSTEM FOR DISTRIBUTED DETECTION NODES
Y.Z. Zhang, T. Shan
Beijing Institute of Technology, China

Poster Session 3
Time: 15:30-16:10, April 16, 2013, Place: Corridor of 3rd floor

B0081 A NOVEL ULTRA-WIDE SWATH SAR BASED ON VARIABLE PRF AND DIGITAL BEAMFORMING
Liu Yadong1 Chen Qian2
1China Academy of Space Technology, China
2Chinese Academy of Sciences, China

B0168 AIRBORNE SAR MOTION COMPENSATION AND IMAGING BASED ON GPU ARCHITECTURE
Li Jun, Liu Yang, Qingrong Hu
Beijing Institute of Radio Measurement, China

B0529 FEATURE LEVEL FUSION OF SAR AND OPTICAL IMAGE AND MPSoC IMPLEMENTATION
FENG Jing1, 2, LI Jun-xia1*, MA Long1, CHEN He1
1Beijing Institute of Technology, China;
2Science China Press, China
B0542 MODIFIED RANGE MIGRATION ALGORITHM INTEGRATED WITH MOTION COMPENSATION FOR FMCW SAR
GuoYi Xue, JunGang Yang, Student Member, IEEE, and PeiGuo Liu
National University of Defense Technology, China

B0579 SEMI-AUTOMATIC IMAGE REGISTRATION USING HARRIS CORNER DETECTION AND RANDOM SAMPLE CONSENSUS (RANSAC)
Mohammed Safy¹, Guangming Shi¹, A.S.Amein²
¹Xidian University, China
²Military Technical College, Egypt

B0582 A NEW LOW ORDER PHASE ERROR ESTIMATION METHOD BASED ON THE OVERLAPPED SPECTRUM IN STEPPED-FREQUENCY SAR
Wenbin Gao, Zegang Ding, Donglin Zhu, Di Yao*
Beijing Institute of Technology, China

B0584 ACCURATE TWO-DIMENSION SPECTRUM OF THE GEO SAR ECHO BASED ON A MODIFIED RANGE MODEL AT APOGEE
DaCheng Liu*, Yu Zhu**, Chong Ni**, ZeGang Ding*¹, Cheng Hu*
*Beijing Institute of Technology, 100081, China
**Chinese Academy of Space Technology, China

B0588 A NOVEL MOTION COMPENSATION APPROACH FOR STEPPED FREQUENCY UAV SAR IMAGERY
Donglin Zhu, Zegang Ding, Wenbin Gao, Weiming Tian
Beijing Institute of Technology, China

B0589 DESIGN AND ANALYSIS OF SCANNING MODE IN SQUINTED SAR
Jie Long, Di Yao, Yingqin Sun
Beijing Institute of Technology

B0590 LFMCW BISTATIC ISAR SPACE TARGET VELOCITY COMPENSATION BASED ON IPD METHOD
Shibao Peng¹, Jia Xu¹,², Cangzhen Meng¹,³, Jian Yang¹, Yingning Peng¹
¹Tsinghua University, China,
²Beijing Institute of Technology, China,
³Airforce Early Warning Academy, China

B0613 IMAGE REGISTRATION OF SAR AND OPTICAL IMAGE BASED ON FEATURE POINTS
Zeng Tao, Ao Dongyang, Hu Cheng*
Beijing Insitute of Technology
B0616  THREE DIMENSIONAL ISAR IMAGING FOR HUMAN BEING  
Zhang Chuanfang, Zhou Ruixue* and Hu Cheng  
Beijing Institute of Technology, China

B0658  AN IMPROVED SCHEME OF DIGITAL BEAM-FORMING IN ELEVATION FOR SPACEBORNE SAR  
Fan Feng*, Hongxing Dang, Xiaomin Tan, Guangting Li, Caipin Li  
China Academy of Space Technology, Xi’an Branch, China

B0707  RESEARCH OF SPARSE SIGNAL TIME-FREQUENCY ANALYSIS BASED ON COMPRESSED SENSING  
HOU Ying-ni, SUN Jun, GUO Ru-jiang, LI Shi-guo  
Nanjing Research Institute of Electronics Technology, China

C0389  ANGEL AND DOPPLER ETSIMATION USING ALTERNATING LEAST SQUARES METHOD IN BISTATIC MIMO RADAR  
Hui Lv*, Meng Zhang  
Luoyang Optoelectro Technology Development Center, China

C0753  TIME AND PHASE SYNCHRONIZATION FOR WIDEBAND DISTRIBUTED COHERENT APERTURE RADAR  
Xiaopeng Yang*, Pilei Yin, and Tao Zeng  
Beijing Institute of Technology, China

D0229  POLARIMETRIC CHARACTERISTICS ANALYSIS OF INTERIOR STRUCTURES OF A BUILDING IN THROUGH-THE-WALL RADAR IMAGING  
Bo Chen*, Tian Jin, Biying Lu, Zhimin Zhou  
National University of Defense Technology, China

D0314  ADAPTIVE PRI SELECTION FOR TRACKING IN CLUTTER  
Guan Zhai*, Huadong Meng and Xi Qin Wang  
Tsinghua University, China

D0327  MULTISENSOR-MULTITARGET TRACKING BASED ON HIERARCHICAL ASSOCIATION ONLY USING RANGE-DOPPLER MEASUREMENTS  
Gongjian Zhou*, Junyu Zhou1, Tianjiao Fu2, Taifan Quan1  
1Harbin Institute of Technology, China  
2Chinese Academy of Sciences, China

D0328  COLOCATED MIMO RADAR SIDELOBE SUPPRESSION USING RANDOM SPACE-TIME CODING  
*Xidian University, China  
* Nanjing Research Institute of Electronic Technology
D0338  CARRIER LEAKAGE CANCELLATION IN PULSE DOPPER RADAR APPLIED FOR SINGLE TARGET DETECTION
Qing Shen, Wei Cui*, Jiangang Hou, Siliang Wu, Hongbao Li
Beijing Institute of Technology, China

D0346  AN AMBIGUITY-RESOLVED CORRECTION ALGORITHM OF PHASE INTERFEROMETER BASED ON KALMAN PREDICTION
Zixiang Wei, Wei Cui*, Feng Li, Jingjing Li, Jing Tian
Beijing Institute of Technology, China

D0351  A CHANNEL EQUALIZATION APPROACH USING THE SPATIAL CORRELATION PROPERTY OF CLUTTERS
Xiangyang Liu¹, Jing Wang², Weiwei Zhao¹, Wei Cao¹, Xuyang Hou²
¹Xi’an Communication Institutes, China;
² Chang’an University, China

D0352  STUDY OF OCEAN MESOSCALE EDDIES SIMULATION IN SHIPBOARD HIGH FREQUENCY SURFACE WAVE RADAR
Zhenyuan Ji, Xiaonan Wang, Junhao Xie, Chunlei Yi, Yang Li
Harbin Institute of Technology, China

D0354  RESEARCH ON THE METHOD OF RADAR-TO-ESM TRACK CORRELATION
Guan Chengbin*, Wang Guohong, Chen Zhonghua
Naval Aeronautical and Astronautical University, China

D0376  DATA ASSOCIATION METHOD COMPARISON WITH AMPLITUDE INFORMATION
Yu Juan*, Wei Shaoming, Wang Jun
Beihang University, China

D0379  ESTIMATION OF NUMBER OF SIGNAL SOURCES IN FAR SEPARATED SUBARRAYS
Qiang Yang*, Ruibin Han
Harbin Institute of Technology, China

D0383  A NEW MANEUVERING TARGET TRACKING METHOD FOR HPRF RADARS
WANG Haoª¹, WANG Naª¹, SONG Zhigangª²
ª¹Workstation of postdoctoral scientific research of 92493 troop, China
ª²92941 troop, China
D0399 AN IMPROVED SUB-APERTURE MOTION COMPENSATION ALGORITHM FOR AIRBORNE REPEAT-PASS INSAR AR
Yin-wei Li*,1,2,3, Mao-sheng Xiang1,2
1National Key Laboratory of Science and Technology on Microwave Imaging, China,
2Chinese Academy of Sciences, China
3University of Chinese Academy of Sciences, China

D0405 A NOVEL RANGE PROFILES SPlicing APPROACH IN STEPPED-FREQUENCY RADARS
Lizhi Zhao*, Xiongjun Fu, JinTie Wu, Meiguo Gao, Qian Zhang
Beijing Institute of Technology, China

D0407 MULTl-VIEW IMAGING OF BUILDING LAYOUT IN THROUGH-WALL-RADAR BASED ON REAL DATA
Liang Yuan, Jing Ma, Lingjiang Kong*, and Yong Jia
University of Electronic Science and Technology of China

D0416 STUDY ON GROUND BASED SPACE SURVEILLANCE COLLOCATED MIMO RADAR
XU Can*, LI Zhi
Academy of Equipment, China

D0419 PARTICLE FILTER FOR HPRF RADAR RANGE AMBIGUITY RESOLVING IN CLUTTERS
TAN Shuncheng*, WANG Guohong, GUAN Chengbin, WANG Na
Naval Aeronautical and Astronautical University, China

D0429 GAUSSIAN MIXTURE IMPLEMENTATION OF PHD FILTER BASED ON DIRICHLET DISTRIBUTION
Gang Wu1, Chongzhao Han1, Xiaoxi Yan2
1Xi’an Jiaotong University, China
2Jiangsu University, China

D0430 A DBS IMAGE STITCHING ALGORITHM BASED ON AFFINE TRANSFORMATION
Hongmeng Chen, Ming Li, Yunlong Lu, Yan Wu
Xidian University, China

D0431 BLOCK NLMS CANCELLATION ALGORITHM AND ITS REAL-TIME IMPLEMENTATION FOR PASSIVE RADAR
Y.D. Zhao*,1,2,3, Y.K. Zhao1,2,3, X.D. Lu1,2, and M.S. Xiang1,2
1National Key Laboratory of Science and Technology on Microwave Imaging, China;
2Chinese Academy of Sciences, China
3Graduate University of Chinese Academy of Sciences, China
D0434  A DOUBLE-CAPON ITERATIVE STAP ALGORITHM FOR AIRBORNE RADAR
Li Xiao-ming1,2, Luo Ding1
1AVIC Radar and Avionics Institute, China;
2Beijing University of Aeronautics and Astronautics, China

D0435  OPTICAL/SAR IMAGE REGISTRATION BASED ON CROSS-CORRELATION
WITH MULTI-SCALE AND MULTI-DIRECTION GABOR CHARACTERISTIC MATRICES
JIANG Yun-hui
Southwest Institute of Electronic Technology of China

D0443  ROBUST BLIND BEAMFORMING WITH ARBITRARY SIDELOBE SHAPE FOR
MIMO RADAR BASED ON SECOND ORDER CONE PROGRAM
LIANG HAO, LI XIAOBO
Electronic Engineering Institute, China

D0453  LEAST SQUARES APPROACH TO THE DESIGN OF FREQUENCY INVARIANT
BEAMFORMER WITH SENSOR DELAY LINES IN SUBBANDS
Hui Chen*, Yongjun Zhao, Donghai Li, Chengcheng Liu, Wanqiu Wang
Zhengzhou Information Science and Technology Institute, China

D0454  A NOVEL PROBABILITY-CONSTRAINED APPROACH TO ROBUST WIDEBAND
BEAMFORMING WITH SENSOR DELAY LINES
Wanqiu Wang *, Yongjun Zhao, Chengcheng Liu, Hui Chen
Zhengzhou Information Science and Technology Institute, China

D0456  NEW METHOD FOR DETECTION AND PARAMETER ESTIMATION of STLFM SIGNAL
Tang Jiang1,2, Zhao Yongjun1, Yang Kun2
1Zhengzhou Information Science and Technology Institute, China;
2PLA Unit 73638, China

D0457  AUTOMATIC RECOGNITION OF RADAR SIGNALS BASED ON
TIME-FREQUENCY IMAGE CHARACTER
Jiandong Zhu, Yongjun Zhao and Jiang Tang
Zhengzhou Information Science and Technology Institute, China

D0472  A SECURE THRESHOLD OF DYNAMIC PROGRAMMING TECHNIQUES FOR
TRACK-BEFORE-DETECT
Liang Cai, Chunlei Cao, Yanhua Wang, Guoxiao Yang
Beijing Institute of Technology, China
D0478  THE IMPACT OF STEP SELECTION IN NLMS ALGORITHM ON LOW VELOCITY TARGET DETECTING FOR PASSIVE RADAR
Li Jichuan¹,², *, Zhao Yaodong¹,², Lu Xiaode²
¹University of Chinese Academy of Sciences, China
²Chinese Academy of Sciences, China

D0483  A RANGE PROFILE MOTION COMPENSATION METHOD FOR INVERSE SYNTHETIC APERTURE LADAR
H. Ruan*, Y. H. Wu, W. Ye
Academy of Equipment, China

D0489  CONSTAINED ADAPTIVE MONOPULSE ALGORITHM BASED ON SUB-ARRAY
LING YAN Dai, RONG FENG Li, CAN Rao
Air Force Early Warning Academy, China

D0493  A MODIFIED MULTIPLE HYPOTHESIS TRACKING ALGORITHM WITH APPLICATION TO RANGE AND DOPPLER MEASUREMENTS
Peng Lv¹*, Guohua Wei¹, Shan Lu¹, Yingjie Zhang¹, Jing Liu²
¹Beijing Institute of Technology, China;
²Northwestern Polytechnical University, China

D0518  A EFFICIENT DESIGN OF A REAL-TIME FFT ARCHITECTURE BASED ON FPGA
Chen Yang, He Chen*
Beijing Institute of Technology, China

D0534  A SUBBANDADAPTIVE FILTER FOR DTV BASED PASSIVE RADAR
Z.H. Zhuo, T. Shan*, Y. Feng, S.H. Liu, J.Zhang
Beijing Institute of Technology, China

D0541  SUBSPACE SIGNAL DETECTION IN COMPOUND-GAUSSIAN CLUTTER
Xiaobo Deng¹,², Changhui Shi¹,², Mingming Guo¹
¹AVIC Radar and Avionics Institute, China
²Aviation Key Lab. of Science and Technology on AISSS, China

D0544  SPARSE PASSIVE RADAR IMAGING BASED ON FM STATIONS USING THE U-ESPRIT FOR MOVING TARGET
Shuo Wang, Yuanhang Tang, Changchang Liu, Tianyun Wang, Weidong Chen
University of Science and Technology of China

D0545  MULTIELEMENT INFORMATION EXTRACTION FROM CITY AREA SAR IMAGES USING THE PERMANENT SCATTERERS TECHNIQUE
Yu Anxi*, Wei Haijun Dong Zhen Sun Zaoyu
National University of Defense Technology, China
D0547 ASPECTS OF INTERFERENCE SUPPRESSION METHOD FOR FORMATION OF AIRCRAFT
Meifang Luo*, Zhimei Hao*, Lingjiang Kong**
*AVIC Radar and Avionics Institute, China
**University of Electronic Science and Technology of China

D0560 AN APPROACH OF BRIDGE DETECTION OVER WATER IN HIGH RESOLUTION SAR IMAGE
Wei Xiong*, Juanjuan Zhong, Lanying Cao
Radar and Avionics Institute of AVIC

D0562 MICRO-DOPPLER FEATURE EXTRACTION USING SINGLE-FREQUENCY RADAR FOR HIGH-SPEED TARGETS
Cai Wang, Xiongjun Fu, Ting Li, Lumin Shi, Meiguo Gao
Beijing Institute of Technology, China

D0606 PERFORMANCE ANALYSIS OF A TRACK BEFORE DETECT DYNAMIC PROGRAMMING ALGORITHM VIA GENERALIZED PARETO DISTRIBUTION
Liang Cai, Chunlei Cao, Yanhua Wang, Guoxiao Yang, Shulin Liu, Le Zheng
Beijing Institute of Technology, China

D0647 3-D FREQUENCY ESTIMATION OF MULTIPLE DAMPED SINUSOIDS USING SUBSPACE APPROACH
Cao Hui*, Wu Yuntao*, Zhang Yanbin* and Huang Longting
*Wuhan Institute of Technology, China.
City University of Hong Kong

D0681 COMPRESSIVE SENSING RADAR IMAGING UNDER LOW SINR VIA WAVEFORM OPTIMIZATION
Ya. Peng. He*, Hong.Xing, Dang, Xiao Min. Tan
China Academy of Space Technology, China

D0683 STUDY ON MICROWAVE SCATTERING OF ROUGH SEA SURFACE BASED ON THE CORRECTED TS MODEL
DaWei Song, Tao Han, She Shang, Dong Li, Wenfeng Sun, Xiaoyan Fan
Science and Technology on Space Microwave Laboratory Chang’an District, China

D0684 SCATTERING CHARACTERISTIC ANALYSIS OF DUAL-BAND FOR NEW PRECIPITATION RADAR
Xiaoyan Fan, Tao Han, She Shang, Dawei Song, Wenfeng Sun, Dong Li
Science and Technology on Space Microwave Laboratory Chang’an District, China
G0593  RECONSTRUCTION OF DIRECTION OF LOS ARRIVAL FOR PASSIVE Emitter LOCALIZATION
Zhang-Xin Chen\textsuperscript{a}, Jiyan Huang\textsuperscript{a} and Guan Gui\textsuperscript{b}
\textsuperscript{a} University of Electronic Science and Technology of China
\textsuperscript{b} Tohoku University, Japan

G0656  REGIONAL Accuracy Analysis of Tropospheric Delay Error Models
Xie Xiao-gang, Zeng Da-zhi, Long Teng
Beijing Institute of Technology, China

G0697  FWT-DCT FEATURE BASED FACE AUTHENTICATION
Jiatong Li, Linbo Tang\textsuperscript{*}, Yixiao Zhao
Beijing Institute of Technology, China

G0715  PERFORMANCE ANALYSIS OF COSTAS-PLL BASED ON FOUR-WAY SIGNAL PROCESSING
Yuan Gao, Lei Zhang\textsuperscript{*}, Jing Yuan
Beijing Institute of Technology, China

G0724  A NOVEL MULTIPATH MITIGATION APPROACH FOR BOC (1, 1) BASED ON PSEUDO-CORRELATION FUNCTION
Hang Ruan, Yiqing Zhang\textsuperscript{*}
Center of Application and Exploitation, China

**Poster Session 4**
**Time:** 15:30-16:10, April 16, 2013  **Place:** Corridor of 5th floor

B0626  SAR IMAGING METHOD FOR HIGH SPEED AND MANEUVERABILITY BASED ON MODIFIED HYPERBOLIC RANGE EQUATION
Yang Lei and Bi Guoan
Nanyang Technological University, Singapore

B0686  SIGNAL CHARACTERISTICS ANALYSIS OF GEO SAR
Caipin Li\textsuperscript{1,2,*}, Mingyi He\textsuperscript{1}
\textsuperscript{1}*Northwestern Polytechnic University, China
\textsuperscript{2} China Academy of Space Technology, China

C0162  BISTATIC INTERFEROMETER BASED ON SPACEBORNE SAR
Qilei Zhang\textsuperscript{*}, Wenge Chang, Feifei Yan
NUDT, China
C0331  TIME RESOURCE SCHEDULING ALGORITHM FOR MULTIPLE TARGET TRACKING IN JAMMING  
Cao Lanying, He Kefeng  
AVIC Radar and Avionics Institute, China

C0730  DESIGN OF THE APF FOR RADAR POWER SYSTEM BASED ON MULTI-RESOLUTION CONTROL  
Dai Qiankun¹, Zou Xiaoyu², Shi Hong¹ Wang Ge¹  
¹AVIC Radar and Avionics Institute, China  
²Aviation Key Laboratory of Science and Technology on AIS, China

C0754  DESIGN OF EXPERIMENTAL ADAPTIVE BEAMFORMING SYSTEM UTILIZING MICROPHONE ARRAY  
Yuze Sun, Ji Zhang, and Xiaopeng Yang*  
Beijing Institute of Technology, China

D0601  AN EFFICIENT METHOD TO CORRECT TARGET RANGE MIGRATION  
Jiao Wang, Ming Li, Zeyu Wang, Yan Wu  
Xidian University, China

D0603  TRACKING IN THE PRESENCE OF RGPO OR VGPO USING THE KALMAN FILTER WITH A NEW MODIFIED PDA  
Xiaoying Deng, Jian Hu, Haibo Liu  
Beijing Institute of Technology, China

D0604  THRESHOLD SETTING OF TRACK-BEFORE-DETECT BASED ON DYNAMIC PROGRAMMING FOR RADAR TARGET DETECTION  
Xiaoying Deng, Ruirui Bi, Haibo Liu  
Beijing Institute of Technology, China

D0607  RANGE PROFILE SYNTHESIS FOR STEPPED CHIRPS VIA MULTICHANNEL BLIND DECONVOLUTION  
Yanhua Wang*  
The State University of New York, USA

D0610  RESEARCH OF NON-COHERENT DETECTION IN JAMMING ENVIRONMENT  
Chengquan Luo, Xiaolin Li  
Radar and Avionics Institute of AVIC, China

D0614  IMPLEMENTATION OF PARALLEL INTERFACE AND MATRIX TRANSPOSE FOR SAR IMAGING BASED ON VIRTEX6 FPGA  
Liu Ying, Xie Yi-Zhuang*, Huang Xing-Bin  
Beijing Institute of Technology, China
D0620  STUDY ON CFAR IN GMTI FOR AIRBORNE FIRE-CONTROL RADAR  
Jiangming, Wuliangbin, Luoding  
Radar and Avionics Institute of AVIC, China

D0622  NOISE JAMMING TO ISAR BASED ON MULTIPLICATION MODULATION  
Gong Shixiang*, Wei Xizhang  
National University of Defense Technology, China

D0629  ADAPTIVE MAINLOBE JAMMING METHOD FOR STAP AIRBORNE RADAR  
Zhimei Hao*, Meifang Luo  
AVIC Radar and Avionics Institute, China

D0631  SIGNAL INTEGRITY OF HIGH-PERFORMANCE AND REAL-TIME SIGNAL PROCESSING SYSTEM  
Xingming Li¹, Shanqing Hu¹*, Jinming Zhang², Teng Long¹  
¹Beijing Institute of Technology, China  
² Beijing Racobit Electronic Information Tecnology Co. Ltd, China

D0632  AMPLITUDE AND PHASE CALIBRATION OF DIGITAL ARRAY RADAR USING FREQUENCY STEPPED SIGNALS  
Liu Haibo, Jiang Han, Yang Xiaojian, WangJunfu  
Beijing Institute of Technology, China

D0637  SIGNAL DYNAMIC ANALYSIS AND CAPTURING TECHNOLOGY RESEARCH OF HIGH-SPEED TARGET  
Haibin Zeng*, Ling Wua , Tao Li³, Xifu Huang⁴  
³Beijing Institute of Tracking and Telecommunication Technology, China  
⁴EAAF, Beijing, China

D0638  AN IMPROVED TARGET EXTRACTION ALGORITHM FOR STEPPED FREQUENCY CHIRP SIGNAL  
ChaoJie.Liang*, Yang Li, DingHong.Lu, Teng. Long, Peng.Chen  
Beijing Institute of Technology, China

D0642  A REFERENCE SIGNAL EXTRACTION TECHNIQUE OF PASSIVE RADAR  
Kui Wang, Jian Yang  
Tsinghua University, China

D0645  MATCHING BETWEEN SAR IMAGES AND OPTICAL IMAGES BASED ON HOG DESCRIPTOR  
Qing Li¹,² Guangzhou Qu² Zengliang Li¹*²  
¹Naval Aeronautical and Astronautical University,China  
²Beijing electro-mechanical engineering institute, China
D0661 AN EVALUATION SYSTEM FOR SAR REAL-TIME PROCESSING SYSTEM
Yingqin Sun, Jian Yang*, Di Yao
Tsinghua University, China

D0666 DESIGN OF DIGITAL IF RECEIVER BASED ON ADCS AND FPGAS
Wei Liu, Di YAO*, Yingqin SUN
Beijing Institute of Technology, China

D0667 A DESIGN METHOD FOR SAR REAL-TIME PROCESSING SYSTEM BASED ON SUPER-STEP
Yingqin Sun, Wei Liu, Di Yao*, Weitao Zhang
Beijing Institute of Technology, China

D0671 A CASCADED FALSE-ALARM ELIMINATION METHOD FOR ACCURATE SHIP DETECTION IN SAR IMAGES
Fukun Bi¹,², Fengqian Pang², Bocheng Zhu¹, Liang Chen²
¹Peking University, China
²Beijing Institute of Technology, China

D0672 DESIGN OF A NOVEL DRFM JAMMING SYSTEM BASED ON AFB-SFB
Jing Yang, Xiaoxu Guo, Yunjie Li
Beijing Institute of Technology, China

D0685 A COMPRESSED SENSING IMAGING METHOD BASED ON RADAR SIGNAL CONSTRUCT SPARSITY BASIS
Sun Wen-Feng, Han Tao, S Hang She, Song Da-Wei, Li Dong, Fan Xiao-Yan
Science and Technology on Space Microwave Laboratory, China

D0688 HIGH RESOLUTION DETECTION IN APPLICATION OF RAILWAY RADAR SYSTEM
Le Zheng, Xinliang Chen*, Han Jiang
Beijing Institute of Technology, China

D0698 DOA ESTIMATION BY EXPLOITING SPATIAL AND DOPPLER SPARSITY
Yan Wang*, Tuo Fu, Meiguo Gao and Shuai Ding
Beijing Institute of Technology, China

D0717 DESIGN OF SPACEBORNE SAR IMAGING PROCESSING AND FAST VERIFICATION BASED ON FPGA
LiuJin, ChenLiang, LiuYing, XieYizhuang
Beijing Institute of Technology, China
D0722 Doppler Ambiguity Resolution Based on Random Sparse Probing Pulses
Zhenmiao Deng¹, Linmei Ye¹, Maozhong Fu¹, Chen Zhao²
¹XiaMen University, China
²University of Auckland, New Zealand

D0723 Sea Clutter Covariance Matrix Estimation With Data-Adaptive Selection
Na Wei
BeiHang University, China

D0734 Micro-Motion Period Estimation of Coning Target Using Four-Point Method
Ting Li, Xiongjun Fu, Lumin Shi, Weijie Yang, Meiguo Gao
Beijing Institute of Technology, China

D0741 Two-Step Motion Compensation Method for Step-Frequency UAV SAR Imagery
Bangkui Fan¹, Teng Long*, Zegang Ding*
¹The Fifty-fifth Research Institute, China
*Beijing Institute of Technology, China

D0742 Monopulse Radar Angle Extractor of Multiple Unresolved Targets via Matching Pursuits
Zheng Lu, Feng Li, Tao Zeng
Beijing Institute of Technology, China

D0749 Reduced-Rank Sub-CPI STAP with Fast Convergence Measure of Effectiveness in Nonhomogenous Clutter
Xiaopeng Yang*, Yongxu Liu, and Teng Long
Beijing Institute of Technology, China

D0750 Calculation of Adaptive Weight Using Pulse Order-Based Inverse Covariance Matrix Recursion for STAP
Xiaopeng Yang*, Yongxu Liu, and Teng Long
Beijing Institute of Technology, China

D0751 Modified PRI-Staggered STAP Algorithm Using Projection Approximation Subspace Tracking
Xiaopeng Yang*, Peng Wang, and Yongxu Liu
Beijing Institute of Technology, China
D0755 DERIVATIVE CONSTRAINT-BASED HOUSEHOLDER MULTISTAGE WIENER FILTER FOR ADAPTIVE BEAMFORMING
Xiaopeng Yang, Yuze Sun, Yongxu Liu, and Ji Zhang
Beijing Institute of Technology, China

E0148 A GENERATOR OF ULTRA-WIDEBAND BALANCED PULSES
Xinfan Xia1,2, Lihua Liu1, Jie Chen1, Hongfei Guan1, Qunying Zhang1, Guangyou Fang1
1Institute of Electronics, Chinese Academy Of Science, China
2Graduate University Of Chinese Academy Of Science, China

E0183 RADIATION PATTERN IMPROVEMENT IN CLOSELY-PACKED ARRAY ANTENNAS BY USING MUSHROOM-LIKE EBG STRUCTURE
Xidian University, China

E0211 AN INTEGRATED FILTERING ANTANNA OF TERAHERTZ ANTENNA-IN-PACKAGE
Lu Hongda, Zheng Chao, Liu Yong, Lv Xin
Beijing Institute of Technology, China

E0230 EMPLOYING DGS STRUCTURES IN DUAL-BAND ANTENNAS FOR MIMO APPLICATIONS WITH HIGH PORT ISOLATION
Fu-Wei Wang, Ying Liu, Shu-Xi Gong, Rui-Xiang Liang
Xidian University, China

E0282 LOG-PERIODIC SLOT ANTENNA WITH MODIFIED CAVITY
Wei Wang, Ying Liu, Hao Yi and Jinyang Xue
Xidian University, China

E0285 A NOVEL OMNIDIRECTIONAL MICROSTRIP COAXIAL COLLINEAR ANTENNA ARRAY
Peng-Fei Zhao, Li-Ming Si, Yong Liu, Xin Lv
Beijing Institute of Technology, China

E0321 FAST OPTIMAL DESIGN AND SIMULATION OF THE WAVEGUIDE SLOTTED ARRAY
Chunxiao Jian, Dongming Zhou, Chong Wang, Peiguo Liu
National University of Defence Technology, China

E0476 METAMATERIAL RESONATORS BASED DUAL-BAND ANTENNA
Li-Ming Si*
Beijing Institute of Technology, China
E0485  A METHOD TO REDUCE SENSITIVITY OF FABRICATION ERRORS IN DESIGN OF PROXIMITY-COUPLED CAVITY-BACKED STACKED PATCHES ANTENNA
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E0499  DESIGN OF HIGH ISOLATION KA-BAND WAVEGUIDE POWER DIVIDER WITH PHASE BALANCE
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E0501  ANALYSIS ON BROADBAND SCATTERING CHARACTERISTICS OF ANTENNA ARRAYS
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E0522  AN INNOVATIVE SUBARRAY PARTITION METHOD BASED ON GENETIC ALGORITHM FOR LINEAR ARRAYS
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National University of Defense Technology, China

E0533  PATTERN SYNTHESIS OF A SMART SKIN ARRAY WITH LOW CROSS-POLARIZATION
Qing Qiang He*, Hai Dan He, Zheng Tao Guan*
Outhwest China Institute of Electronic Technology, China

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Jieran Li¹, Jia XU¹,², Xu dong ZHANG¹
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E0575  DESIGN OF DUAL-POLARIZATION AND PARALLEL-SERIES-FED MICROSTRIP ANTENNA ARRAY
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DA-WEI ZHANG, JUN LI, HAI-HONG MA
CHINA ACADEMY OF SPACE TECHNOLOGY, CHINA

E0669 A MULTI-LAYER HALF MODE SUBSTRATE INTEGRATED WAVEGUIDE IN-PHASE POWER COMBINER
Yazhou Dong, Shi-wei Dong, Member, IEEE, Ying Wang and Liming Gong
China Academy of Space Technology (Xi’an), China

E0675 A REALIZATION OF CONVENIENT STRUCTURE WITH ELECTRICAL COUPLING IN COAXIAL CAVITY
Jinsong Zhan1, 2, Liming Gong2, Xiaolong Chen1
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E0687 L-BAND HIGH EFFICIENCY GAN HEMT POWER AMPLIFIER FOR SPACE APPLICATION
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China Academy of Space Technology, China

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Jingyan Mo1, Liang Shen2, Bing Wei3, Weidong Fang1, Ying Yan3
1 Shanghai University, China
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3 Xidian University, China

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Nanjing University of Posts and Telecommunications, China

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Wuhan University, China
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H. Y. Yao, X. X. Li, W. F. Sun, X. Y. Ma
Air Force Early Warning Academy, China

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Zhao Hao*, Zhang Gong
Nanjing University of Aeronautics and Astronautics, China

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Beijing Univ. of Aeronautics and Astronautics, China

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LIU Wei*, WANG Chao, ZHANG Xian  
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Liu Wei, Zhao Xiao-Ming, Hu Bao-Jun, Zhang Xian  
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D. Gray, J. Thornton†  
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†Tsinghua University, China  
2Beijing Institute of Technology, China

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Dalin Feng, Jian Li* Feng Liu
Beijing Institute of Technology, China

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Tiandong Liu*, Yu ZhU**, Chong Ni**, Zegang Ding*1, Cheng Hu*
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The University of New South Wales, Australia
G0673  THE SPACEBORNE TERAHERTZ REMOTE SENSING TECHNIQUES
Feng Liu*, Wanzhao Cui, Zhongbo Zhu, Shiwei Dong, She Shang, Zhoushi Yao
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Beijing Institute of Technology, China

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Kai Jing, Ji Zhang, Di Yao*
Beijing Institute of Technology, China
Layout of Conference Venue

Layout of 3rd floor

Layout of 5th floor
About Xi'an

Xi'an is the capital of Shaanxi province, located in the southern part of the Guanzhong Plain. With the Qinling Mountains to the south and the Weihe River to the north, it is in a favorable geographical location surrounded by water and hills. Xi'an, the eternal city, witnesses the great changes of the Chinese nation just like a living history book, called Chang'an in ancient times. Xi'an is one of the birthplaces of the ancient civilization in the Yellow River Basin area of the country. During 3,100-year development, Xi'an has been the capitals of 13 Dynasties. So far, Xi'an enjoys equal fame with Athens, Cairo, and Rome as one of the four major ancient civilization capitals.

Xi'an is also a world-famous tourist city, a treasure house of cultural relics. The remains of past civilizations furnish evidence of every major epoch in China's 5000-year history, making for a particularly illustrative textbook of Chinese culture. The history of Xi'an is so ancient and continuous that the city has no parallel anywhere as a cultural site. Xi'an was the starting point of the world-famous Silk Road. It can be well likened to a history museum. Moving around this ancient city is like going through thousands of years back in time. Any experience in Xi’an will bring you fun and possibly a little surprise!

Terra Cotta Warriors and Horses Museum

The renowned Terra-Cotta Warriors and Horses Museum is 35 Km east of Xi’an, 1.5 Km east of the mausoleum of Emperor Qin Shi Huang. The local farmers were drilling irrigation well when pottery fragments and ancient bronze weapons were accidentally discovered in March 1974. Two more sites were discovered to the north of the first one respectively in 1976. They were named Vault 1, 2, and 3 by order of discovery. The museum now mainly consists of three buildings, which were constructed on the original sites at different times. Following the discovery of Vault 1, Vault 2 and Vault 3 were brought to light in April and May of 1976. Vault 3 was opened in 1989, while Vault 2, excavated in March of 1994, was opened in October of the same year. Besides these three major vaults, two sets of bronze chariots and horses were discovered to the west of Emperor Qin Shi Huang’s mausoleum in December of 1980, and have been on display at the museum after their restoration.
Huaqing Hot Springs

Huaqing Hot Springs stands at the foot of Li Shang Mountain, 35 Km East of Xian. Because of the natural hot springs, beautiful scenery and legends, it became a famous scenic spot and resort as far back as Western Zhou Dynasty, 3000 years ago. It had been reconstructed and enlarged by later dynasties, such as Zhou, Qin and Han. It got to the most flourishing age during the period of Emperor Tai Zong, 7th Emperor of the Tang Dynasty, and his favorite concubine Yang Yuhuan, known as Lady Yang or Concubine Yang. Huaqing Hot Springs is not only because of its famous and beautiful scenic spots since ancient times but also it was the place where the well-known Xi’an Incident took place in Chinese modern history.

The Big Wild Goose Pagoda

The Big Wild Goose Pagoda, called Dayan Ta in Chinese, is one of the famous Buddhist pagodas in China. It stands in Da Ci En Temple (The Temple of Great Maternal Grace) to the south of Xian. The temple was built about 648 AD by the order of Emperor Gao Zong, the third emperor of the Tang Dynasty. He had the temple built in memory of his mother who died when he was quite young. In 652 AD, Monk Xuan Zang who spent 17 years on studying Buddhism in India and known as the most famous Buddhist scholar, translator, and great traveler as well, made a proposal to the court for a pagoda to be built in the temple to store the scriptures and statues he brought back from India. He became the first abbot when the pagoda was built in 652. The pagoda is now 64 meters tall with seven stories.
Bell Tower & Drum Tower

The Bell Tower in Xian is situated in the very heart of the city and at the junction of four main roads. There is a huge bell hanging on the roof of the tower which was traditionally used to tell the time by and there are other, smaller bells on exhibit in the tower too.

Known as the symbol of Xian, its history can be traced back to the Ming Dynasty. Each Ming city had a bell tower and a drum tower. The bell was sounded at dawn and the drum at dusk. The Bell Tower was originally set at the intersection of Xi Dajie (West Street) and Guangji Jie (Guangji Street) in the Yingxiang Temple, which was the center of the site of the old Tang Imperial City. It was removed to its present place in 1582 in the center of the southern section of the walled city and was restored several times.

The tower has a square-shaped brick platform, each side of which is 35.5 meters (116 feet) long and 8.6 meters (28 feet) high and on the top is a triple-eaved, two-story wooden structure with carved beams and color-painted rafters, a further 27.4 meters (90 feet) high. Colorful Dougong -- a unique Chinese architecture of brackets inserted on the top of columns and crossbeams strengthen the building and enhance the artistic. The design of this kind is also perceptible from the engravings on bronzes dating back to the Warring States Period (475-221 B.C.). The inside is a remarkable example of the very intricate roof truss system used in Ming and Qing wooden architecture. In a corner of the brick platform is a Ming-period bell.

To the west of the Bell Tower is the Drum Tower. This is a smaller building, situated in a lively street which is filled with street traders and hawkers. This tower marks the entrance to the city’s Muslim Quarter which is a lovely area to wander and observe. the felling here is almost of a "city within a city" and the streets around this district heading up to the Mosque are like a small village crammed with people selling all kinds of weird and wonderful things.
Transportation