

# **29th International Technical Meeting of the Satellite Division of the Institute of Navigation (ION GNSS 2016)**

Portland, Oregon, USA  
12-16 September 2016

Volume 1 of 5

ISBN: 978-1-5108-3410-1

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<a href="#"><u>Real Data and Real Time SBAS Dual Frequency Multiconstellation (DFMC) Platform</u></a>	1401 - 1414
Julián Barrios, José Gabriel Pericahgo, Guillermo Fernández, Victor Manuel Esteban, José Celada, Daniel Pérez, Miguel Ángel Fernández, Davide Rizzo, Javier Ostolaza	
<a href="#"><u>Avionics-Based GNSS Integrity Augmentation for UAS Mission Planning and Real-time Trajectory Optimisation</u></a>	1415 - 1431
Roberto Sabatini, Terry Moore, Chris Hill - <b>Peer Reviewed</b>	

## **C2: UAV Navigation**

<a href="#"><u>Evaluation of Wind Effects on UAV Autonomous Navigation Based on Vehicle Dynamic Model</u></a>	1432 - 1440
Mehran Khaghani, Jan Skaloud	
<a href="#"><u>Centimeter-Level Positioning for UAVs and Other Mass-Market Applications</u></a>	1441 - 1454
Cécile Mongrédien, Jean-Philippe Doyen, Marten Strom, Daniel Ammann	

<a href="#"><u>Precise UAV Position and Attitude Estimation by Multiple GNSS Receivers for 3D Mapping</u></a>	1455 - 1464
Taro Suzuki, Yusuke Takahashi, Yoshiharu Amano	
<a href="#"><u>GNSS Interference in Unmanned Aerial Systems</u></a>	1465 - 1476
Wim De Wilde, Gert Cuypers, Jean-Marie Sleewaegen, Richard Deurloo, Bruno Bougard	
<a href="#"><u>Integration of Onboard Sensors and Local Area DGNSS to Support High Integrity Unmanned Aerial Vehicles (UAV) Navigation</u></a>	1477 - 1484
Jinsil Lee, Minchan Kim, Jiyun Lee	
<a href="#"><u>Graphical Approach for MAV Sensors Fusion</u></a>	1485 - 1491
Zheng Gong, Ling Pei, Danping Zou, Ruihang Miao, Peilin Liu, Wenxian Yu	
<a href="#"><u>Signals of Opportunity Aided Inertial Navigation</u></a>	1492 - 1501
Joshua J. Morales, Paul F. Roysdon, Zaher M. Kassas - <b>Best Presentation</b>	
<a href="#"><u>Landmark Based Autonomous Snowplow Navigation</u></a>	1502 - 1511
Michael Bowyer, Angelo Bertani, Erik Aitken, Samir A. Rawashdeh	
<a href="#"><u>Cooperative Navigation between a Ground Vehicle and an Unmanned Aerial Vehicle in GNSS-Challenged Environments</u></a>	1512 - 1521
Victor O. Sivaneri, Jason N. Gross	
<a href="#"><u>Aircraft Dynamics Model Augmentation of GNSS Based Navigation and Guidance Systems for RPAS</u></a>	1522 - 1530
Francesco Cappello, Subramanian Ramasamy, Roberto Sabatini - <b>Peer Reviewed</b>	
<b>C3: UAV Navigation 1 (Invited Speakers Session)</b>	
<a href="#"><u>Quantifying Navigation Safety of Autonomous Passenger Vehicles (APVs)</u></a>	1531 - 1557
Mathieu Joerger, Matthew Spenko	
<a href="#"><u>UAVs vs. Natural Autonomous Vehicles (NAVs)-Are We Closing the Gap?</u></a>	1558 - 1584
John F. Raquet	
<b>C4: UAV Navigation 2 (Invited Speakers Session)</b>	
<a href="#"><u>Integrity Monitoring for UAS Flight Control Software</u></a>	1585 - 1608
Jason Rife, Hu Huang, Sam Guyer	
<b>C5: Atmospheric Science 1</b>	
<a href="#"><u>Tropospheric Duct Anomaly Threat Model for High Integrity and High Accuracy Navigation</u></a>	1609 - 1616
Samer Khanafseh, Axel Von Engeln, Boris Pervan, Illinois Institute of Technology - <b>Peer Reviewed</b>	
<a href="#"><u>Evaluation of Surface Variables from Global Reanalysis Models and their Application in Precipitable Water Vapour Retrieval from GNSS Observations over Nigeria</u></a>	1617 - 1641
Olalekan Adekunle Isioye - <b>Best Presentation Student Paper Award - Peer Reviewed</b>	
<a href="#"><u>Deriving the Mean Tropospheric Temperature Model using AIRS and AMSU for GNSS Precipitable Water Vapour Estimation</u></a>	1642 - 1648
Rata Suwanton, Chalermchon Satirapod, Panu Srestasathiern, Chaiyaporn Kitpracha - <b>Peer Reviewed</b>	
<a href="#"><u>A New Approach for Ionospheric TEC Prediction at a GPS Station</u></a>	1649 - 1656
M.M. Hoque, N. Jakowski, J. Berdermann - <b>Peer Reviewed</b>	
<a href="#"><u>Middle-Latitude Ionospheric Irregularities and Scintillation During Geomagnetic Storms</u></a>	1657 - 1663
Xiaoqing Pi, Anthony J. Mannucci, Bonnie Valant-Spaight, Rodney Viereck, Yongliang Zhang	
<a href="#"><u>Impact of GNSS Receiver Tuning on the Estimation of Scintillation Index</u></a>	1664 - 1671
S. Rougerie, M. Ait-Ighil, V. Fabbro - <b>Peer Reviewed</b>	

<a href="#"><u>Studies of Equatorial Plasma Bubbles and the Associated Ionospheric TEC Gradients over South America</u></a>	1672 - 1679
Rezy Pradipta, Patricia H. Doherty - Peer Reviewed	
<a href="#"><u>Equatorial Amplitude Scintillation Spectrum Analysis and Fading Characteristics on GPS Signals</u></a>	1680 - 1687
Yu Jiao, Dongyang Xu, Yu Morton, Charles Rino - Peer Reviewed	

## **C6: GNSS Augmentation Systems and Integrity 3**

<a href="#"><u>Mitigation of Short Duration Satellite Outages for Advanced RAIM and other Integrity Systems Based on GNSS</u></a>	1688 - 1695
Juan Blanch, Yu-Hsuan Chen, R. Eric Phelts, Todd Walter, Per. Enge - Peer Reviewed	
<a href="#"><u>Exploiting Satellite Motion in ARAIM: Measurement Error Model Refinement Using Experimental Data</u></a>	1696 - 1712
Mathieu Joerger, Boris Pervan - Best Presentation - Peer Reviewed	
<a href="#"><u>H-ARAIM Exclusion: Requirements and Performance</u></a>	1713 - 1725
Yawei Zhai, Boris Pervan, Mathieu Joerger - Peer Reviewed	
<a href="#"><u>Nominal Range Error Analysis to Support ARAIM</u></a>	1726 - 1735
Santiago Perea, Michael Meurer, Ilaria Martini, Markus Rippl, Mathieu Joerger, Boris Pervan	
<a href="#"><u>Kalman Filter-Based GNSS Integrity Monitoring</u></a>	1736 - 1749
Susmita Bhattacharyya	
<a href="#"><u>Signal Quality Monitoring for New GNSS Signals</u></a>	1750 - 1763
J-B. Pagot, P. Thevenon, O. Julien, Francisco Amarillo-Fernandez, Denis Maillard	
<a href="#"><u>Horizon-to-elevation Mask: A Potential Benefit to Ionospheric Gradient Monitoring</u></a>	1764 - 1779
Safoora Zaminpardaz Student Paper Award - Peer Reviewed	
<a href="#"><u>Robust Chi-Square Monitor Performance with Noise Covariance of Unknown Aspect-Ratio</u></a>	1780 - 1792
Jason Rife - Peer Reviewed	
<a href="#"><u>GPS SISRE/URA Integrity Analysis for ARAIM</u></a>	1793 - 1803
F. Mistrapau, B. Bija, G. Cueto-Felgueroso, M. Odriozola, M. Azaola, A. Cezón, F. Amarillo-Fernández	
<a href="#"><u>A Frequency Domain-based Detection Technique for Digital Distortion on GNSS Signals</u></a>	1804 - 1813
Chao Sun, Hongbo Zhao, Chen Zhuang, Wenquan Feng	

## **D1a: Current Advances in Indoor Location (with demonstrations)**

<a href="#"><u>Smartphone-based Hybrid Indoor Positioning System with Integration of Wi-Fi Fingerprinting and Magnetic Matching</u></a>	1814 - 1823
Pei-Yu Huang, Shau-Shiun Jan, David S. De Lorenzo, Ivy Tseng	
<a href="#"><u>Positioning Algorithm Adaptation of an Indoor Navigation System for Virtual Reality Game Applications</u></a>	1824 - 1830
Mengdi Jia, Sihao Zhao, Dengyue Dong, Xiaowei Cui, Mingquan Lu	
<a href="#"><u>The Improvement of Location Fingerprint Atlas of WLAN Indoor Positioning Technology</u></a>	1831 - 1837
Min Yu, Kaixuan Guo, YaQing Li, Zhi Zeng, Rui Tang, Hang Guo	
<a href="#"><u>A New Smartphone-based Indoor GPS Positioning System</u></a>	1838 - 1842
Rui Xu, Wu Chen, Yang Yang, Jianye Liu, Rongbin Li	

## **D1b: Land-Based Applications 1**

<a href="#"><u>A Method for Multipath Detection and Mitigation in Railway Control Applications</u></a>	1843 - 1855
Alessandro Neri, Veronica Palma, Francesco Rispoli, Sam Pullen, Shiwen Zhang, Sherman Lo, Per Enge	
<a href="#"><u>A Study on Cycle Slip Detection for Integrated Navigation of Single Frequency GNSS Receiver and Low Cost INS</u></a>	1856 - 1884
Younsil Kim, Junesol Song, Byungwoon Park, Changdon Kee	
<a href="#"><u>An Integrated Algorithm Based on BeiDou/GPS/IMU and its Application for Anomalous Driving Detection</u></a>	1885 - 1890
Rui Sun, Ke Han, Jun Hu, Hongyang Bai, Washington Y. Ochieng - <b>Best Presentation</b>	
<a href="#"><u>Achievement of Continuous Decimeter-Level Accuracy Using Low-Cost Single-Frequency Receivers in Urban Environments</u></a>	1891 - 1913
Motoki Higuchi, Nobuaki Kubo	
<a href="#"><u>Generation and Evaluation of the Track Map Database for GNSS-based Train Positioning Using a Map-tool-chain</u></a>	1914 - 1926
Jian Wang, Wei-jie Tao, Bai-gen Cai, Jiang Liu, Federico Grasso Toro	
<a href="#"><u>A Reverse Approach to Antenna Specifications for London Buses Next-generation Positioning System</u></a>	1927 - 1936
Xin Zhang, Zhenjun Zhang, Washington Ochieng, Shaojun Feng, Baoyu Liu, Yanrong Xue	

## D2: PANEL: Urban Navigation

<a href="#"><u>Location Accuracy in the Urban Environment</u></a>	1937 - 1960
Frank van Diggelen	
<a href="#"><u>Benefits of Dual Freq (L1+L5) GNSS Receivers in Multipath Environments</u></a>	1961 - 1966
Manuel del Castillo	
<a href="#"><u>Solving the Urban Positioning Problem using 3D-Mapping-Aided GNSS</u></a>	1967 - 1984
Paul Groves	
<a href="#"><u>Low-Cost Precise Urban Positioning</u></a>	1985 - 2032
Todd Humphreys, Ken Pesyna, Daniel Shepard, Matthew Murrian, Andrew Kerns	
<a href="#"><u>Locating Autonomous Vehicle in Urban Environments</u></a>	2033 - 2044
Liang Heng	

## D3: High Precision GNSS Positioning 1

<a href="#"><u>The Validation and Accuracy Analysis of BDS Solar Radiation Pressure Models</u></a>	2045 - 2057
Xiaoya Wang, Qunhe Zhao, Xiaogong Hu, Rui Guo	
<a href="#"><u>Integer Satellite Clock Combination for Precise Point Positioning with Ambiguity Resolution</u></a>	2058 - 2068
Garrett Seepersad, Simon Banville, Paul Collins, Sunil Bisnath, François Lahaye	
<a href="#"><u>Multi-GNSS PPP Performance Assessment with Different Ranging Accuracies in Challenging Scenarios</u></a>	2069 - 2081
Javier Míguez, José V. Perello Gisbert, Raúl Orus Pérez, J. Antonio García-Molina, Xavi Serena, Francisco Gonzales, Gonzalo Seco Granados, Massimo Crisci - <b>Best Presentation - Peer Reviewed</b>	
<a href="#"><u>Fast PPP Convergence Using Multi-constellation and Triple-frequency Ambiguity Resolution</u></a>	2082 - 2088
D. Laurichesse, A. Blot	
<a href="#"><u>Galileo, an Ace up in the Sleeve for PPP Techniques</u></a>	2089 - 2100
I. Rodríguez-Pérez, L. Martínez Fernández, G. Tobías-González, J.D. Calle-Calle, M. Romay, M.D. Láinez, P.F. Navarro	
<a href="#"><u>Phase Cycle Slip Mitigation by Piecewise Polynomial Doppler FIT</u></a>	2101 - 2106
Tsvi G. Dvorkind - <b>Peer Reviewed</b>	
<a href="#"><u>Characterising High Precision GNSS Receiver Positioning Performance using Internal Receiver Uncertainties from Repeatable Real World Signals</u></a>	2107 - 2122
Ahmad Ridhwanuddin Tengku, Allison Kealy, Simon Fuller - <b>Peer Reviewed</b>	

## D4: High Precision GNSS Positioning 2

### [Track Constrained RTK for Railway Applications](#)

Alessandro Neri, Salvatore Sabina, Roberto Capua, Pietro Salvatori - **Peer Reviewed**

2123 - 2135

### [QZSS RTK-PPP Application to Autonomous Cars](#)

Kori Asari, Shigeru Matsuoka, Hisao Amitani

2136 - 2142

### [An Algorithm of Detecting and Repairing One Cycle Wide Lane Integer Ambiguity Error for Short Baseline](#)

Shuo Liu, Lei Zhang, Jian Li, Meina Li

2143 - 2148

### [Millimeter Accuracy of RTK Positioning Employing Helix Antennas with Cutoff Patterns](#)

D. Tatarnikov, A. Stepanenko, A. Astakhov, L. Rapoport - **Best Presentation**

2149 - 2154

### [A Totally SDR Single-Frequency Augmentation Infrastructure for RTK Land Surveying: Development and Test](#)

R. Capua, A. Caporale, L. Gattuso, M. Giangolini, D. Tuffillaro, C. D'Amico, D. Antonetti, A. Bottaro, F.C. Ferrante

2155 - 2165

## D5a: PANEL: Navigation 2026

### [Navigation 2026](#)

Jason Y. Kim

2166 - 2173

### [Navigation 2026 – Dependable Accuracy in all Hands](#)

Bruno Bougard

2174 - 2188

### [Project SEXTANT](#)

Randy Villahermosa, Ranwa Haddad

2189 - 2199

### [Navigation 2026](#)

Greg Turetzky

2200 - 2209

## D5b: Next-generation Sensors in Phones, Tablets and Wearables

### [Moving Forward to the Future Low-Cost PPP Paradigm](#)

D. Calle, P. Navarro, I. Rodríguez, G. Tobias - **Best Presentation**

2210 - 2235

### [Traceability for PNT Security Service](#)

Ting Liu, Haitao Wu, Dapeng Li

2236 - 2242

### [A High Precision Indoor Positioning Method Based on Visible Light Communication with Visual Information Matching](#)

Gong Yingkui, Zhou Xinlin, Deng Lizhi, Liu Bingcheng, Yang Guang

2243 - 2250

## D6a: Complementary PNT 1

### [Particle Filter Based WiFi Positioning System Implementation Using WiFiSLAM Radio Map](#)

Beomju Shin, Chulki Kim, Jaehun Kim, Changdon Kee, Taikjin Lee

2251 - 2253

### [Obstruction-Aware Bluetooth Low Energy Indoor Positioning](#)

Arief Affendi Juri, Tughrul Arslan, Fengzhou Wang - **Peer Reviewed**

2254 - 2261

### [Performance Characterization of Positioning in LTE Systems](#)

Kimia Shamaei, Joe Khalife, Zaher M. Kassas - **Best Presentation - Peer Reviewed**

2262 - 2270

### [The 5G Localization Waveform Ranging Accuracy over Time-Dispersive Channels – An Evaluation](#)

Emanuel Staudinger, Michael Walter, Armin Dammann

2271 - 2280

<a href="#"><u>Characterization of Sector Clock Biases in Cellular CDMA Systems</u></a>	2281 - 2285
Joe Khalife, Zaher M. Kassas	
<a href="#"><u>Indoor Localization for Bluetooth Low Energy Devices Using Weighted Off-set Triangulation Algorithm</u></a>	2286 - 2292
Xiaoyue Hou, Tughrul Arslan, Arief Juri, Fengzhou Wang	

## **D6b: Complementary PNT 2**

<a href="#"><u>A Modular Approach to Integrity for APNT</u></a>	2293 - 2299
Okury Osechas, Elizabeth Nossek, Boubeker Belabbas, Michael Meurer	
<a href="#"><u>Leveraging Commercial Broadband LEO Constellations for Navigating</u></a>	2300 - 2314
Tyler G. Reid, Andrew M. Neish, Todd F. Walter, Per K. Enge - <b>Best Presentation</b>	
<a href="#"><u>Automated High Precision Optical Tracking of Aircrafts and non-cooperative Flying Objects</u></a>	2315 - 2317
Sébastien Guillaume, Alain Geiger, Maurizio Scaramuzza	
<a href="#"><u>Modelling the L-Band Air to Ground Channel for Navigation Applications</u></a>	2318 - 2334
Nicolas Schneckenburger, Thomas Jost, Uwe-Carsten Fiebig, Hosseinali Jamal, David Matolak, Ruoyu Sun	
<a href="#"><u>Crowdsourced Fingerprint Database Update for Indoor Localization</u></a>	2335 - 2356
Boseon Yu, Taikjin Lee	

## **E1: PANEL: Status of GPS, GLONASS, Galileo, BeiDou, and QZSS**

<a href="#"><u>GPS</u></a>	2357 - 2375
Steven Whitney	
<a href="#"><u>GLONASS</u></a>	2376 - 2390
Sergey Karutin	
<a href="#"><u>Galileo Program Status</u></a>	2391 - 2409
Eric Chatre	
<a href="#"><u>GALILEO System Status</u></a>	2410 - 2430
Marco Falcone	
<a href="#"><u>BeiDou</u></a>	2431 - 2485
Jun Shen, Haitao Wu	
<a href="#"><u>Project Overview of the Quasi-Zenith Satellite System</u></a>	2486 - 2527
Yoshiyuki Murai	

## **E2a: BeiDou: Hosted by the Chinese Academy of Sciences**

<a href="#"><u>An Open Testing Platform for BeiDou/GNSS</u></a>	2528 - 2551
Haitao Wu	
<a href="#"><u>Precise Orbit Determination for Multi-GNSS Satellites in Wuhan IGS-MGEX Analysis Center</u></a>	2552 - 2572
Qile Zhao	
<a href="#"><u>BDS/GNSS Application Development: From Experiments to Mass Deployment</u></a>	2573 - 2616
Jun Shen	
<a href="#"><u>China GNSS Haoping Radio Observatory and Monitoring Results</u></a>	2617 - 2653
Ke Jing	
<a href="#"><u>BeiDou Signal Parameters Characterization During Strong Equatorial Ionospheric Scintillation</u></a>	2654 - 2661
Dongyang Xu, Yu (Jade) Morton	

## **E2b: PANEL: Galileo Evolutions**

<a href="#"><u>GALILEO &amp; EGNOS Evolution Programme: The Road to 2030</u></a>	2662 - 2676
Eric Chatre	



<a href="#"><u>GALILEO Evolution: A User Perspective</u></a>	2677 - 2695
Justyna Redelkiewicz, Marco Caparrini	
<a href="#"><u>Status on GNSS/Galileo Evolutions and R&amp;D Activities</u></a>	2696 - 2715
Miguel Manteiga Bautista	
<a href="#"><u>Status of Galileo System Evolution Studies</u></a>	2716 - 2732
Gustavo López-Risueño	

## **E3a: GNSS Augmentation Systems and Integrity 2**

<a href="#"><u>Integrity Monitoring for Advanced Driver Assistance Systems</u></a>	2733 - 2753
Ahmed El-Mowafy, Nobuaki Kubo	
<a href="#"><u>SBAS-Africa: A Cost Effective Southern African Solution Serving Multiple Market Sectors</u></a>	2754 - 2765
J. Ostolaza, D. Pérez, J.J. Lera, D. Hill, V. Boissinot, W. Roberts, S. Basker, E. Avenant, G. Lamprecht, S. Sheppard, P. Milway, M. Reche	
<a href="#"><u>Analysis of SBAS Orbit and Clock Corrections for GPS and their Applicability to Today's Mass Market Multi-GNSS Personal Navigation</u></a>	2766 - 2776
Mojtaba Bahrami, Geraint Ffoulkes-Jones, Qiang Zhang	
<a href="#"><u>Performance Differentiation in a Tightly Coupled GNSS/INS Solution</u></a>	2777 - 2788
Ryan Dixon, Michael Bobye - <b>Best Presentation</b>	
<a href="#"><u>Satellite Selection Methodology for Horizontal Navigation and Integrity Algorithms</u></a>	2789 - 2798
Daniel Gerbeth, Ilaria Martini, Markus Rippl, Michael Felux	
<a href="#"><u>An On-board Autonomous Detection Method of Carrier Leakage on GNSS Signal</u></a>	2799 - 2807
Zhiqiang Rong, Hongbo Zhao, Hua Sun, Chao Sun, Zhijun He	

## **E3b: Modernization of GNSS 1**

<a href="#"><u>On the Inherent Tracking Error Caused by CEM and Imperfect Spreading Code of GNSS Signal</u></a>	2808 - 2815
Jiayi Zhang, Zheng Yao, Jun Shen, Mingquan Lu	
<a href="#"><u>Towards Dual Mode Secure Navigation Using the Galileo Public Regulated Service (PRS) and PGS Precise Positioning Service (PPS)</u></a>	2816 - 2825
N. Davies, A. Evans, M. Jones, M. Macleod, R. Bowden, D. Hagan, H. Mayoh, D. Mathews - <b>Best Presentation</b>	
<a href="#"><u>Data Integrity for GPS and Galileo Signals used by Civil Aviation</u></a>	2826 - 2838
Axel Garcia-Pena, Olivier Julien	
<a href="#"><u>A Modified Min-Sum Decoding Algorithm for LDPC Codes Based on Analysis of Overestimating Value</u></a>	2839 - 2848
Xiaowen Chen, Hongbo Zhao, Zhijun He, Wenquan Feng	

## **E4: Modernization of GNSS 2**

<a href="#"><u>Galileo Simple Box-wing Model Plus ECOM for Improving Orbit and Clock Prediction Performances</u></a>	2849 - 2863
A. García, D. Luque, P.F. Navarro, G. Tobías	
<a href="#"><u>Centimeter Level Augmentation Service (CLAS) in Japanese Quasi-Zenith Satellite System, its User Interface, Detailed Design, and Plan</u></a>	2864 - 2869
M. Miya, S. Fujita, Y. Sato, K. Ota, R. Hirokawa, J. Takiguchi	
<a href="#"><u>First Experimentation Results with the Full Galileo CS Demonstrator</u></a>	2870 - 2877
D. Calle, S. Cancela, E. Carbonell, I. Rodríguez, G. Tobías, I. Fernández-Hernández	



### [NANU Analysis for 2007 Through 2015](#)

John W. Lavrakas 2878 - 2886

### [GPS Receiver Impact from the UTC Offset \(UTC0\) Anomaly of 25-26 January 2016](#)

Karl Kovach, Philip J. Mendicki, Edward Powers, Brent Renfro 2887 - 2895

### [The GPS Block IIR Antenna Panel Pattern and its Use on-Orbit](#)

Willard Marquis 2896 - 2909

### [Maturation of GPS III Signal Integrity Improvements](#)

Arnold Peckjian, Stuart Shaw, Andrew J. Katronick 2910 - 2921

### [Advanced Message Generation Facility for Future GNSS Broadcasting](#)

Samuele Fantinato, Luca Canzian, Nicola Montini, Stefano Montagner, Oscar Pozzobon, Andrea Dalla Chiara, Giovanni Gamba, José Ángel Ávila-Rodríguez, Rigas Ioannides, Francesca Zanier 2922 - 2930

### [A Decentralized Method for BeiDou Satellite Autonomous Orbit Determination Based on Schmidt-Kalman Filter](#)

Zhijun He, Hongbo Zhao, Wenquan Feng, Chao Sun 2931 - 2937

## **E5: Methods for Authentication and Anti-spoofing**

### [A Novel Navigation Message Authentication Scheme for GNSS Open Service](#)

Gianluca Caparra, Silvia Sturaro, Nicola Laurenti, Christian Wullems, Rigas T. Ioannides - **Peer Reviewed** 2938 - 2947

### [Message Authentication, Channel Coding & Anti-Spoong](#)

James T. Curran, Cillian O'Driscoll - **Peer Reviewed** 2948 - 2959

### [GNSS Receiver Fingerprinting for Security-Enhanced Applications](#)

Daniele Borio, Ciro Gioia, Gianmarco Baldini, Joaquin Fortuny - **Peer Reviewed** 2960 - 2970

### [GNSS Spoof Detection Using Passive Ranging](#)

Peter F. Swaszek, Richard J. Hartnett, Kelly C. Seals 2971 - 2980

### [An INS Monitor Against GNSS Spoofing Attacks During GBAS and SBAS-assisted Aircraft Landing Approaches](#)

Cagatay Tanil, Samer Khanafseh, Boris Pervan - **Peer Reviewed** 2981 - 2990

### [Using Tactical and MEMS Grade INS to Protect Against GNSS Spoofing in Automotive Applications](#)

Sashidharan Manickam, Kyle O'Keefe - **Peer Reviewed** 2991 - 3001

### [Secure Position and Time Information by Server Side PRS Snapshot Processing](#)

Alexander Rügamer, Daniel Rubino, Ivana Lukcin, Simon Taschke, Manuel Stahl, Wolfgang Felber 3002 - 3017

### [Joint Antenna Array Attitude Tracking and Spoofing Detection Based on Phase Difference Measurements](#)

Manuel Appel, Andriy Konovaltsev, Michael Meurer - **Best Presentation** 3018 - 3026

### [Detailed Analysis of the TEXBAT Datasets Using a High Fidelity Software GPS Receiver](#)

Adam Lemmenes, Phillip Corbell, Sanjeev Gunawardena 3027 - 3032

### [Effect of Tracking Parameters on GNSS Receivers Vulnerability to Spoofing Attack](#)

Ali Broumandan, Ali Jafarnia-Jahromi, Saeed Daneshmand, Gérard Lachapelle - **Peer Reviewed** 3033 - 3043

### [Spatial Spoofing Signal Suppression Using the Constellation Covariance Matrix](#)

L. Kurz, S. Zorn, T.G. Noll 3044 - 3052

## **E6a: Interference and Spectrum Protection 1**

### [Interference Localization using a Controlled Radiation Pattern Antenna \(CRPA\)](#)

Gerhard Berz, Pascal Barret, Brent Disselkoen, Michael Richard, Okko Bleeker, Vincent Rocchia, Florence Jacolot, Todd Bigham 3053 - 3062

<a href="#"><u>Empirical Assessment and Modelling of RFI Impact on Aviation GPS/SBAS Receiver Performance</u></a>	3063 - 3069
M. Scaramuzza, P. Truffer, M. Troller, H. Wipf, H. Leibundgut, M. Bertschi, S. Rämi	
<a href="#"><u>Assessment of the Effect of Quantization on the Degradation Brought by Interference on a GNSS Receiver</u></a>	3070 - 3090
Olivier Julien, Antoine Blais	
<a href="#"><u>Potential Threats by a Symmetric Deployment of Replay Devices Against Synchronization via a Navigation Satellite System</u></a>	3091 - 3093
Takashi Iwamoto	

## **E6b: Interference and Spectrum Protection 2**

<a href="#"><u>Demonstration of UAV Based GPS Jammer Localization During a Live Interference Exercise</u></a>	3094 - 3106
Adrien Perkins, Louis Dressel, Sherman Lo, Tyler Reid, Kazuma Gunning, Per Enge - <b>Best Presentation</b>	
<a href="#"><u>Jammer Localization: From Crowdsourcing to Synthetic Detection</u></a>	3107 - 3116
Daniele Borio, Ciro Gioia, Andrej Štern, Franc Dimec, Gianmarco Baldini - <b>Peer Reviewed</b>	
<a href="#"><u>Developing a Real-world Test Framework and Methodology for PNT Systems and Devices</u></a>	3117 - 3122
G. Buesnel, J. Pottle, R. Boyles, F. Simon-Galabardon, Mark Holbrow	
<a href="#"><u>An Analysis of Near-band Harmful Interference on Civilian GPS Receivers</u></a>	3123 - 3132
Connor L. Brashar Student Paper Award - <b>Peer Reviewed</b>	
<a href="#"><u>PROGRESS Project: Jamming and Spoofing Detection and Localization System for Protection of GNSS Ground-based Infrastructures</u></a>	3133 - 3142
Giovanni Gamba, Andrea Dalla Chiara, Oscar Pozzobon, Damien Serant	
<a href="#"><u>From Agnostic to Model-Based GNSS Jamming Detection</u></a>	3143 - 3152
Daniele Borio, Eduardo Cano, Ciro Gioia - <b>Peer Reviewed</b>	
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