



Royal Institute of Navigation
Science Technology Practice



IESSG
Institute of Engineering Surveying & Space Geodesy



2nd GNSS Vulnerabilities and Solutions Conference

**Baška, Krk Island, Croatia
2 – 5 September 2009**

Technical co-sponsors:

Institute of Transport and Communications, Zagreb, Croatia



Faculty of Transport and Traffic Sciences, University of Zagreb, Croatia



Polytechnic of Bjelovar, Croatia



Welcome to 2nd GNSS Vulnerabilities and Solutions Conference!

The Royal Institute of Navigation, London, UK, and the Institute of Engineering Surveying and Space Geodesy, University of Nottingham, UK, have a pleasure in welcoming you to the **2nd GNSS Vulnerabilities and Solutions 2009 Conference** to be held on **2 - 5 September 2009 in Baska, Krk Island, Croatia**.

This four-day event aims to gather GNSS experts and focuses on GNSS problems and vulnerabilities, as well as to developments aiming to improve the accuracy and reliability of GNSS. Unique environment of Baska and its natural resources and rich history, combined with friendly hospitality will again create an inspiring atmosphere for ideas and knowledge exchange, well known to those who attended the last year's conference.

Three special sessions are organised in order to address particular causes of GNSS vulnerabilities:

- Space Weather and Ionospheric Effects on GNSS,
- Safety Critical Applications and
- Intelligent Transport Systems (ITS)

The latest developments can be followed on the special Twitter channel at: <http://twitter.com/satnavigator>. At the same time, the important information can be found at the RIN conference web-site at: <http://tinyurl.com/coc5h4>.

Special all-inclusive accommodation package is available for conference participants, who are kindly asked to book the accommodation at their earliest convenience with Hoteli Baška. Details are presented in a dedicated section of this programme.

Participation to the 2nd GNSS Vulnerabilities and Solutions Conference is subject to a registration with the Royal Institute of Navigation. Conference participants are kindly requested to fill in the registration form available in this document and send it with participation fee payment details to RIN Director Gp Capt David Broughton, as explained in the form.

The conference venue is well connected with several airports in Central Europe via Rijeka/Krk Airport (<http://www.rijeka-airport.hr/schedule.asp>). Visitors from nearby countries will find travel to Baška by car very convenient.

You are kindly invited to join the leading GNSS experts and discuss the most important issues related to further exploitations of satellite navigation systems in the wonderful Mediterranean environment of Northern Adriatic. In addition, the organising committee kindly appreciate your efforts in informing your colleagues about the event.

Finally, you are invited to contact Dr Renato Filjar, FRIN (e-mail: renato.filjar@yahoo.co.uk) for any further information or assistance you may need in regard to your participation to the 2nd GNSS Vulnerabilities and Solutions Conference in Baška.

We are looking forward for a privilege to welcome you to Baška.

Conference organising committee

International Programme Committee

Terry Moore, FRIN, University of Nottingham, UK, Chair
David Barnes, OBE FRIN, The Royal Institute of Navigation, London, UK, Co-chair
Norman Bonnor, FRIN, The Royal Institute of Navigation, London, UK
Ljiljana R Cander, Rutherford Appleton Laboratory, Chilton, UK
Paul Cross, FRIN, University College London, UK
Hrvoje Gold, University of Zagreb, Croatia
Miro Govedarica, University of Novi Sad, Serbia
Bernhard Hoffman-Wellenhof, Technical University of Graz, Austria
Norman Hughes, FRIN, The Royal Institute of Navigation, London, UK
Darko Huljenić, Ericsson Nikola Tesla, Zagreb, Croatia
Gordan Ježić, University of Zagreb, Croatia
Serdjo Kos, FRIN, University of Rijeka, Croatia
David Last, FRIN, Consultant Engineer and Expert Witness, Conwy, UK
Andy Norris, FRIN, University of Nottingham, UK
Washington Ochieng, FRIN, Imperial College London, UK
Adam Weintrit, FRIN, Gdynia Maritime University, Poland
Bruno Zolesi, Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy

Organising committee

David Broughton, MBE FRIN, The Royal Institute of Navigation, London, UK, Chair
Renato Filjar, FRIN, The Royal Institute of Navigation Croatian Branch, Co-chair
Djurdja Daljevac, Hoteli Baška, Croatia
Tomislav Kos, FRIN, University of Zagreb, Croatia
Majda Šale, Baška Tourist Office, Croatia
Marko Ševrović, Institute of Transport and Communications (IPV), Zagreb, Croatia
Krešimir Vidović, Institute of Transport and Communications (IPV), Zagreb, Croatia

2 September 2009	
20.00	<p style="text-align: center;"><i>Opening ceremony</i></p> <p style="text-align: center;">David Barnes, OBE FRIN, President, The Royal Institute of Navigation, London, UK</p> <p style="text-align: center;">Prof Terry Moore, FRIN, The Institute of Engineering Surveying and Space Geodesy, University of Nottingham, UK</p> <p style="text-align: center;">Ljiljana R Cander, Rutherford Appleton Laboratory, Chilton, UK</p> <p style="text-align: center;">Majda Šale, Tourist Office Baška, Croatia</p> <p style="text-align: center;">Djurdja Daljevac, Hoteli Baška, Croatia</p> <p style="text-align: center;"><i>Welcome cocktail – Atrium Residence Baška Hotel</i></p>
3 September 2009	
8.30	Registration
	<p><i>Plenary session</i></p> <p><i>Chairman: Prof T Moore, FRIN</i></p>
9.00	<p>H Skalski USA <i>TBD</i></p>
9.20	<p>D Last United Kingdom <i>GPS forensics, crime and jamming</i></p>
9.40	<p>S G Lanza Spain <i>GINA – GNSS for Innovative road Applications: Accuracy and reliability of EGNOS/Galileo for road user charging and value added services</i></p>
10.00	<p>Dr Bruno Zolesi, Rome, Italy <i>Ionospheric COST Actions – Effects of the upper atmosphere on terrestrial and earth-space communications and navigation</i></p>
10.20	<p>Sharafat Gadimova, Office of Outer Space Affairs, United Nations Vienna, Austria <i>International Committee on Global Navigation Satellite Systems (ICG): A system of systems</i></p>
10.40	<p><i>Coffee break</i></p>
	<p><i>Session: Space weather effects on GNSS</i></p> <p><i>Chairman: Prof W Ochieng, FRIN</i></p>
11.00	<p>J Laštovička Czech Republic <i>Atmospheric waves causing ionospheric disturbances as one of sources of ionospheric perturbations of GNSS</i></p>
11.20	<p>Lj R Cander United Kingdom <i>Total electron content enhancement over Europe at solar minimum</i></p>
11.40	<p>T L Gulyaeva Russia <i>Application of GPS-derived total electron content maps</i></p>

	<i>to derivation of planetary ionospheric storm index</i>	
12.00	I I Shagimuratov Russia <i>Development of high-latitude phase fluctuations of GPS signals in northern and southern hemisphere during storm</i>	
12.30	<i>Lunch</i>	
	<i>Session: Intelligent Transport Systems Chairman: Prof David Last, FRIN</i>	<i>Session: Space weather effects on GNSS Chairman: Dr Lj R Cander</i>
15.00	M Al Nabhan United Kingdom <i>An adaptive and accurate GPS positioning model for LBS applications: A predefined user and application parameters approach</i>	I I Shagimuratov Russia <i>Storm-time modification of the ionosphere: analysis of GPS TEC maps with high spatial-temporal resolution</i>
15.20	G Baldini Italy <i>European best practices in safe transport of dangerous materials supported by GNSS</i>	J Boska Czech Republic <i>Changes of electron density profile and TEC during extreme manifestation of solar activity</i>
15.40	M Sevrovic Croatia <i>TBD</i>	H Haralambous Cyprus <i>Space weather events: Ionospheric critical frequencies and total electron content over Nicosia</i>
16.00	K Vidovic Croatia <i>TBD</i>	D Virkes Croatia <i>Aspects of terrestrial radio propagation in positioning systems</i>
16.20	D Skarica Croatia <i>Vessel Tracking and Movement Radius Notification</i>	A Swiatek Poland <i>Investigation of the structure of the solar terminator in the ionosphere using the GPS technique</i>
16.40	<i>Coffee break</i>	
	<i>Session: Space weather effects on GNSS Chairman: Dr J Lastovicka</i>	
17.00	E I Asatfyeva Russia <i>Space weather and ionospheric effects on GNSS at mid latitudes: The scattering of ionosphere irregularities and solar radio bursts interference</i>	
17.20	I Stanislawska Poland <i>Space weather related terrestrial weather radio communication parameters</i>	
17.40	S Lejeune Belgium <i>Near real time assessment of the ionosphere effect on</i>	

	<i>high accuracy GNSS applications which require ambiguity resolution</i>	
18.00	<p>R Filjar Croatia <i>A study of GPS performance in Central Europe during severe space weather conditions in December 2006</i></p>	
18.20	<p>Iu V Cherniak Ukraine <i>Validation of GPS Radio Occultation Data by Kharkiv Incoherent Scatter Radar</i></p>	
21.00	<i>Cocktail party on Baška Promenade – sponsored event</i>	
4 September 2009		
<p><i>Session: Safety-critical applications</i> <i>Chairman: Gp Capt D Broughton, FRIN</i></p>		
9.00	<p>T Ferreira Portugal <i>A software platform to support studies on E1/L1 band</i></p>	
9.20	<p>E Lacarra Spain <i>The role of ESSP in the detection of EGNOS performance anomalies and their evaluation</i></p>	
9.40	<p>Ph X Quang Italy <i>SAT-SURF and SAT-SURFER: a flexible platform for both R&D and training on GNSS</i></p>	
10.00	<p>J Lindsay United Kingdom <i>The support helicopter navigator – From basics to redundant</i></p>	
10.20	<p>I Tijardovic Croatia <i>Automatic Identification System practical research</i></p>	
10.40	<i>Coffee break</i>	
	<i>Session: Safety-critical applications</i> <i>Chairman: Prof S Kos, FRIN</i>	<i>Session: Space weather effects on GNSS</i> <i>Chairman: Prof I Stanislawska</i>
11.00	<p>T Noack Germany <i>Integrity concepts for future maritime Ground Based Augmentation Systems</i></p>	<p>L Jaworski Poland <i>EGNOS-EUPOS integration project for the territory of Poland</i></p>
11.20	<p>G Dove Italy <i>The SWAN project: results and critical aspects</i></p>	<p>R Filjar Croatia <i>Reliability of the International GNSS Service for GNSS performance studies in Croatia</i></p>
11.40	<p>K K Trajkovski Slovenia <i>Valuation and improvement of indoor positioning for HSGPS receiver</i></p>	<p>A Swiatek Poland <i>Ionospheric response for solar terminator derived from GPS TEC</i></p>

		<i>measurements</i>
12.00	M Felux Germany <i>A robust and effective GNSS/INS integration optimizing cost and effort</i>	H Namaoui Algeria <i>Water vapour and GNSS tropospheric delay</i>
12.20	M Lukas Croatia <i>Use of GPS systems in SAR activities by Croatian Mountain Rescue Service</i>	T Kos Croatia <i>Estimation MOPS/EGNOS tropospheric delay model accuracy at northern and southern latitudes</i>
13.00	<i>Lunch</i>	
21.00	<i>Conference dinner with live music</i>	
5 September 2009		
	<i>Session: GNSS methods Chairman: Prof H Gold</i>	<i>Session: Safety-critical applications Chairman: Prof T Kos, FRIN</i>
9.00	N Sahai India <i>Multipath navigation algorithm</i>	G Manzoni Italy <i>Use of GNSS in general environment</i>
9.20	U Engel Germany <i>Interference mitigation in the eigenvector-domain</i>	I Mandusic Croatia <i>GPS-aided search and rescue mission over the open sea area</i>
9.40	A Hirle Germany <i>GNSS error part separation using Hilbert Huang Transform</i>	I Ivanova Bulgaria <i>NAVITEQ GNSS infrastructure network</i>
10.00	J Balodis Latvia <i>EUPOS®, LATPOS and EUPOS®-RIGA</i>	G Rivera Guatemala <i>TBD</i>
10.20	<i>Coffee break</i>	
	<i>Session: Intelligent Transport Systems Chairman: Prof S Kos, FRIN</i>	
10.40	R Kostelic Croatia <i>Control of Training Candidates for Drivers of Motor Vehicles Using a Satellite Positioning System</i>	
11.00	D Zupanovic Croatia <i>Possibilities of implementing Bluetooth and GPS technologies in real-time vehicle tracing in urban environment</i>	
11.20	G Dadic Croatia <i>The impact of introducing the system for informing drivers about traffic conditions through high technology</i>	

11.40	<i>Closing session</i>
12.30	<i>Lunch</i>

2nd GNSS Vulnerabilities and Solutions Conference
Baška, Krk Island, Croatia
2 – 5 September 2009

Accommodation packages for conference participants

Hotel Zvonimir (4-star), luxury rooms

	Single room	Double room
Conference package <u>per person</u>	EUR 336	EUR 312
Every extra day, <u>per person</u> , half-board	EUR 76	EUR 68
Tax per day	EUR 1.35	EUR 1.35

Hotel Corinthia (3-star), rooms

	Single room	Double room
Conference package <u>per person</u>	EUR 300	EUR 276
Every extra day, <u>per person</u> , half-board	EUR 65	EUR 57
Tax per day	EUR 1.35	EUR 1.35

Conference package includes:

- 3 nights full-board accommodation (arrival: 2 September, afternoon, departure: 5 September, after lunch)
- Welcome cocktail (Hotel Atrium Residence Baška, 2 September 2009, evening)
- Cocktail Party prior to the conference dinner (Swimming pool, Hotel Corinthia, 4 September, evening)
- Conference dinner with live music Klapa Nevera (Hotel Zvonimir, 4 September, evening)
- Conference facilities
- a complimentary voucher for one-time use of hotel spa facility
- discounted prices for extended stay (prior to or after the conference) at Hoteli Baška

Conference participants are kindly advised to book their accommodation packages at earliest possible convenience with Ms Valentina Topić, Hoteli Baška, e-mail: topic@hotelibaska.hr.



Royal Institute of Navigation

Land Air Sea Space

PLEASE COMPLETE IN BLOCK CAPITALS and post/ fax or email this entire form to:

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Tel : +44 20 7591 3135, Fax: +44 20 7591 3131, E-mail : director@rin.org.uk

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2ND GNSS VULNERABILITIES AND SOLUTIONS CONFERENCE REGISTRATION

Surname..... Initials First Name

Mr/Mrs/Dr/etc Job Title

Company VAT Registration No

Address

Town Postcode/ZipCountry

PhoneFaxE-mail

Please **EXCLUDE** my details from the published Delegate List.

Additional details (e.g. dietary, details of extra persons attending and any other requirements)¹

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.....

PAYMENT²

	Cost GB £ per delegate exc VAT	Number and names of delegates
Delegates ³	52.17	

Delegate Benefits:

- (1) Please note any dietary or other requirements for all delegates in the space provided above (please attach extra pages if more space is required).
- (2) All prices exclusive of VAT- please add on below.
- (3) The delegate administration fee includes the CD of the Conference proceedings.

SUB-TOTAL £

Add VAT @ 15% £

TOTAL TO PAY £

By enclosed cheque (£ Sterling only) or bank draft.

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ISSUE DATE. EXPIRY

SWITCH ISSUE No SECURITY CODE

Total to be charged £

Signature

All payments must be received by the start of the Conference (02 September 2009).

Please invoice me/my Company for payment.
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