



Table of Contents

	Page
<u>Simulation and Test Beds</u>	
Certification of a Galileo Test Range	1
Volker LOGEMANN, Martin GRZEBELLUS	
Galil-EU: An Approach for Testing Geo-informatics in a Large Field Demonstrator ...	12
Martin PÖLÖSKEY, Olaf LUDWIG, Otmar SCHUSTER, Manfred BÄUMKER, Heinz-Juergen PRZYBILLA, Christian NEYERS	
The GUIDE High-Precision Test Facility (GNSS Laboratory)	18
Bénédicte CALVET, L. MONTOYA, P. GRANDJEAN	
Real World GNSS Test Environment under Laboratory Conditions	25
Christopher SCHIRMER, Wim A. Th. KOTTERMAN, Giovanni DEL GALDO, Gregor SIEGERT, Alexander RÜGAMER, Albert HEUBERGER, Markus H. LANDMANN	
In-the-loop Testing of Location Based Services and Navigational Applications in a Laboratory Environment	32
Ina PARTZSCH, Georg FÖRSTER, Robert RICHTER, Oliver MICHLER	
Testing of GNSS Receivers with Recorded and Replayed Signals of Multiple Constellations.....	36
Karen von HÜNERBEIN, Werner LANGE	
<u>GNSS System Aspects</u>	
Space Weather Impact on Satellite Navigation in Aviation	42
Norbert JAKOWSKI, Jens BERDERMANN, Claudia BORRIES, Nikolai HLUBEK, Mohammed Mainul HOQUE, Volker WILKEN	
The Galileo Public Regulated Service (PRS) A Certified GNSS Service for Security- relevant Users in Europe	48
Stefan BAUMANN, Christoph STADLER	
Basis for certification of GNSS Receivers by Means of Reliability Analysis.....	54
Federico GRASSO TORO, Debiao LU, Eckehard SCHNIEDER	
Synchronized Acquisition of Measurements.....	60
Philipp BERTHOLD	
Cooperative Localisation by Using Landmarks and DGPS	67
Andreas TOLLKÜHN, Lucila PATIÑO-STUDENCKA, Jörn THIELECKE Florian MICKLER	



Jamming and Spoofing

- Simulation of Spoofing and Interference for Single Antenna and Multi-User/Antenna Configurations** 73
Achim HORNBOSTEL
- GNSS Airport Interference Monitoring System** 79
Stefan HINTEREGGER, Philipp BERGLEZ
- A New Solution of Generation of Spoofing Signals for GNSS Receivers**..... 86
Werner LANGE, Karen von HÜNERBEIN

Maritime Applications

- Standards for Maritime Navigation Systems and Receivers**..... 92
Nick WARD, Alan GRANT

Rail Applications

- Innovative Simulations of GNSS Performances in a Realistic Railway Environment** 98
Juliette MARAIS, Cyril MEURIE, Amaury FLANQUART, Simon LITHGOW,
George BARBU
- Real-time Verification of GNSS Receiver Measured Train Location** 103
Debiao LU, Eckehard SCHNIEDER
- SIL 4 Compliant Train Location Determination System Based on Dual-Constellation EGNOS-R Interface for ERTMS/ETCS** 109
Aleš FILIP, Francesco RISPOLI

Road Applications

- A New Approach towards GNSS-Receiver Comparison in Multipath Environments**.. 115
Dirk SPIEGEL, Eckehard SCHNIEDER, Federico GRASSO TORO
- Tightly coupled Position and Attitude Determination with two low-cost GNSS receivers, a Gyroscope and an Accelerometer** 122
Patrick HENKEL, P. BERTHOLD, Christoph GÜNTHER
- Challenges in GNSS Road User Charging and French Implementation Experience**... 128
Grégoire DUCHÂTEAU, Yves CAPELLE, Michel MONNERAT, Damien SERANT,
Yves BARDOUT
- Wireless Communication Techniques for Half-Automated Evaluation of Automotive Active Pedestrian Safety Systems** 139
Michael HEUER, Ayoub Al-HAMADI, Marc-Michael MEINECKE, Eugen SCHNEIDER,
Hermann ROHLING, Peter SOROWKA



Aviation Applications

Geo-Information in the Cockpit: Safe Emergency Landing in Alpine Terrain 148
 Florian ALBRECHT, Jirathana DITTRICH, Florian LIPOK, Volker LOGEMANN

EGNOS Safety-of-Life Service Certification 153
 Christopher NEVILLE

**Feasibility of Certification Issues of Multi-Constellation Aviation Receivers in the
 Presence of Mandates (or-Perpendicular Mandates) 161**
 Paul NISNER, John KORNA

Poster Session

**Certification of Road User Charging: Approach, Standardisation and Role of
 Laboratories..... 166**
 Grégoire DUCHÂTEAU, Xavier LEBLAN, Yves CAPELLE, François PEYRET

Investigation of the Gyro-sensor Contribution to the Straight Movement of Vehicle... 176
 Michal HODOŇ, Michal CHOVANEC

List of Authors viii