

# Final PROGRAMME 2016 DGON Inertial Sensors and Systems

Programme Committee: S. Zimmermann (Chairman), T. Erler, W. Geiger, E. von Hinüber, J.-F. Wagner, T. Löffler

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## Tuesday, September 20, 2016

08:00 Registration  
09:00 Welcome

### Session 1: FOG I

(CHAIRMAN: T. Erler)

- 09:10 **Touching the limit of FOG Angular Random Walk: challenges and applications**  
Frédéric Guattari, E. Ducloux, E. de Toldi, C. Molucon, J. Honthaas  
(ixblue, Saint-Germain-En-Laye, FRANCE)
- 09:40  **$\mu$ Rad Accumulated Angle Error FOG**  
Meir Rosilio, Arnon Arbel, L. Koenigsberg, N. Pasternak  
(Al Cielo Inertial Solutions Ltd, Jerusalem, ISRAEL)
- 10:10 **Understanding and control of the magnetic sensitivity of a fiber-optic gyroscope**  
de Toldi Elliot<sup>1</sup>, [F. Guattari, C. Molucon]<sup>1</sup>, [G. Mélin, T. Villedieu]<sup>2</sup>, [H. C. Lefèvre]<sup>3</sup>  
(<sup>1</sup>ixBlue SAS, Navigation Systems Business Unit, R&D Gyros, Saint Germain en Laye, FRANCE  
<sup>2</sup>ixBlue, Photonic Solutions Business Unit, Lannion, FRANCE  
<sup>3</sup>ixBlue, Saint Germain en Laye, FRANCE)

10:40 **Coffee Break**

### Session 2: FOG II

(CHAIRMAN: M. Perlmutter)

- 11:10 **20 Years of KVH Fiber Optic Gyro Technology: The Evolution from Large, Low Performance FOGs to Compact, Precise FOGs and FOG-based Inertial Systems**  
Jay Napoli, Roger H. Ward  
(KVH Industries, Inc., Guidance & Stabilization Division, Middletown, RI, USA)
- 11:40 **High performance Embedded GNSS INS (EGI) based on FOG sensors technology for Safety Critical Airborne applications**  
Roberto Senatore, Andrea Pizzarulli, Danilo Durante, Massimo Verola, Mike Perlmutter  
(Civitanavi Systems, Pedaso (FM), ITALY)
- 12:10 **Quality Factor Variation Measured in a Monolithic Fused Silica Cylindrical Resonator**  
Yao Pan, D. Y. Wang, T. L. Qu, S. Y. Wu, J. P. Liu, H. C. Zhao, X. H. Liu, K. Y. Yang, H. Luo  
(College of Optoelectronic Science and Engineering, National University of Defense Technology, Changsha, CHINA)
- 12:40 **Lunch Break (95min)**

### Session 3: Cylindrical and Hemispherical Resonator Gyros

(CHAIRMAN: W. Geiger)

- 14:15 **A New Metallic Coriolis Vibratory Gyroscope (CVG) with Multiple-shell Structure**  
Xiang Xi, Yulie Wu, Dingbang Xiao, Yongmeng Zhang, Xuezhong Wu  
(College of Mechatronics Engineering and Automation, National University of Defense Technology, Changsha, CHINA)
- 14:45 **Toward Software Defined Coriolis Gyroscopes: Dynamic SelfCalibration of QMG and milli-HRG**  
Alexander Trusov<sup>1</sup>, Dough Meyer<sup>1</sup>, [A. Bettadapura, G. H. Mccammon]<sup>1</sup>, [M. R. Philips]<sup>2</sup>  
(<sup>1</sup>Northrop Grumman Systems Corporation, Woodland Hills, CA, USA  
<sup>2</sup>Wright-Patterson Air Force Base, Dayton, Ohio, USA)
- 15:15 **Coffee Break**
- 15:45 **Primus: SWAP-oriented IMUs for multiple applications**  
Alexandre Lenoble, T. Rouilleault  
(Sagem, Eragny sur Oise, FRANCE)

### Session 4: Future Trends

(CHAIRMAN: S. Zimmermann)

- 16:15 **The Future of the MEMS Inertial Sensor Performance, Design and Manufacturing**  
Michael Perlmutter<sup>1</sup>, [Stephen Breit]<sup>2</sup>  
(<sup>1</sup>Civitanavi Navigation Systems, Pedaso (FM), ITALY,  
<sup>2</sup>Coventor, Inc., Cary, NC, USA)
- 16:45 End Presentations Day 1
- 19:30 (entrance 19:00) Dinner at the "Festsaal im Studentenhaus" – The ballroom of the University

### Alternate:

#### **Space grade fiber optic gyroscope: R&D results and flight tests**

Yuri Korkishko<sup>1</sup>, [V. A. Fedorov, V. E. Prilutskiy, V. G. Ponomarev, I. V. Morev, D. V. Obuhovich, S. M. Kostritskii, A. I. Zuev, V. K. Varnakov, A. V. Belashenko]<sup>1</sup>, [E. N. Yakimov, G. V. Titov, A. V. Ovchinnikov, I. B. Abdul'minov, S. V. Latyntsev]<sup>2</sup>  
(<sup>1</sup>LLC RPC Optolink, Moscow / Zelenograd, RUSSIA  
<sup>2</sup>Academician M. F. Reshetnev Information Satellite Systems, Zheleznogorsk / Krasnoyarsk region, RUSSIA)

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## Wednesday, September 21, 2016

**Session 5: Gyro Compassing / Northfinding** (Chairman: T. Löffler)

- 09:00 **Orbital GyroCompass Evolution**  
Donald B. Reid  
(Lockheed Martin Space Systems, San Jose, CA, USA)
- 09:30 **Advances in Lightweight Precision North Finding and Positioning Inertial Systems**  
Jason Bias<sup>1</sup>, [N. Mathur]<sup>2</sup>, [R. Thorpe]<sup>3</sup>  
<sup>1</sup>Night Vision & Electronic Sensors Directorate, Ground Combat Systems Division, Fort Belvoir, VA, USA  
<sup>2</sup>Night Vision & Electronic Sensors Directorate, CACI, Fort Belvoir, VA, USA  
<sup>3</sup>Soldier Precision Targeting Devices (PM SPTD), NCI, Fort Belvoir, VA, USA

**Session 6 MEMS** (Chairman: G. F. Trommer)

- 10:00 **Closed-loop MEMS accelerometer: from design to production**  
Boris Grinberg, A. Feingold, L. Koenigsberg  
(Physical Logic Ltd., Petah Tikva, ISRAEL)
- 10:30 **Coffee Break**
- 11:00 **First results with MEMS tilt sensors on bridges**  
Stefan König, P. Leinfelder  
(Northrop Grumman LITEF GmbH, Dept. EAT, Freiburg, GERMANY)

**Session 7 Integrated Systems** (Chairman: J. F. Wagner)

- 11:30 **Aerodynamic Parameters Compensation in the SINS/AMM/GNSS Integrated Navigation System**  
Shen Jieliang, Zhu Xinhua, Wang Yu, Su Yan  
(Nanjing University of Science and Technology, School of Mechanical Engineering, Nanjing, CHINA)
- 12:00 **Mixed H2 / H $\infty$  Filter for Automatic Aircraft Landing with Optical Sensors**  
Christian Tonhäuser, P. Hecker  
(Technische Universität Braunschweig, Institute of Flight Guidance, Braunschweig, GERMANY)
- 12:30 **Lunch Break (90min)**
- 14:00 **INS/GNSS/Odometer Data Fusion in Railway Applications**  
Christian Reimer, F.-J. Müller, E. v. Hinüber  
(iMAR Navigation GmbH, St. Ingbert, GERMANY)

**Session 8 Signal Processing / Algorithms** (Chairman: E. v. Hinüber)

- 14:30 **IndoorGuide – A Multi Sensor Pedestrian Navigation System for Precise and Robust Indoor Localization**  
Jan Ruppelt, Gert F. Trommer  
(Institute of Systems Optimization (ITE), Karlsruher Institut für Technologie (KIT), Karlsruhe, GERMANY)
- 15:00 **Coffee Break**
- 15:30 **Multiple model concepts in navigational applications**  
Michael Ger<sup>1</sup>, [M. Westenkirchner, G. Herbold]<sup>1</sup>, [C. van Ommeren]<sup>2</sup>  
<sup>1</sup>MBDA Deutschland GmbH, Schrobenuh, GERMANY  
<sup>2</sup>Technical University of Munich, München, GERMANY
- 16:00 **An Alternative Approach to Eliminate the Motion Induced Disturbances in Dead Reckoning Navigation**  
Yakov Binder, Yury Litmanovich, [T. Paderina]  
(Concern CSRI Elektropribor, JSC, St. Petersburg, RUSSIA)

### Alternate:

**Sensor Fusion for Land Vehicle Slope Estimation**  
Nicola Palella, [L. Colombo, F. Pisoni, G. Avellone]  
(STMicroelectronics, Automotive Digital Division, Infotainment BU, Agrate Brianza (MB), ITALY)