

2017 DGON Inertial Sensors and Systems

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

PROGRAMME

Tuesday, September 19, 2017

08:00 Registration
09:00 Welcome

Session 1: GYROS #1 - Part I (CHAIRMAN: M. Perlmutter)

09:15 **Next Generation Optical Fibers For Small Diameter Fiber Optic Gyroscope (FOG) Coils**
Andy Gillooly, M. Hill, T. Read, P. Maton
(Fibercore Limited, Fibercore House, University Parkway, Southampton, Hampshire, SO16 7QQ, UNITED KINGDOM)

09:40 **Model building method of single-axis interferometric FOG based on thermally induced nonreciprocal error**
Wei Gao, Runfeng Zhang, Bo Zhao, Pengfei Wu, Yue Zhang
(Harbin Institute of Technology, Harbin, CHINA)

10:05 **Highest bias stability fiber optic gyroscope SRS-5000**
Yuri Korkishko, Igor Fedorov, V. A. Fedorov, V. E. Prilutskiy, V. G. Ponomarev, S. M. Kostitskiy, I. V. Morev, D. V. Obuhovich, S. V. Prilutskiy, A. I. Zuev, V. K. Varnakov
(LLC RPC OPTOLINK, Zelenograd, Sosnovaya alley, Moscow 124489, RUSSIA)

10:30 **Coffee Break (30min)**

cont. Session 1 GYROS #1 - Part II (CHAIRMAN: T. Erler)

11:00 **First Steps for a Giant FOG: Searching for the Limits**
Frédéric Guattari¹, Hervé Lefèvre¹, [Elliot de Toldi, Alexandre Bigueur, Damien Ponceau, Cédric Moluçon, Eric Ducloux]¹
Joachim Wassermann², Ulrich Schreiber³
¹Xblue, blueSeis division, rue de la Croix de Fer, 78100, Saint Germain en Laye, FRANCE
²LMU Department of Earth & Environmental Sciences, Munich, GERMANY
³TUM Forschungseinrichtung Satellitengeodäsie, Geodätisches Observatorium Wettzell, Munich, GERMANY)

11:25 **FOG based INS for satellite launcher application**
Daniele Grifi, Roberto Senatore, Enrico Quatraro, Massimo Verola, Andrea Pizzarulli
(Civitanavi Systems, Via del Progresso, 63827 Pedaso (FM), ITALY)

Session 2: ACCELEROMETERS (CHAIRMAN: S. Zimmermann)

11:50 **Miniature High-Performance Quartz Accelerometer for High-Dynamic, Precision Guided Systems**
Jose Beitia
(InnaLabs Ltd., Snugborough Road, Blanchardstown, Dublin 15, IRELAND)

12:15 **Lunch break (90min)**

13:45 **To the production of a robust and highly accurate MEMS vibrating accelerometer**
Pierre-Olivier Lefort, Isabelle Thomas, Sebastien Jaud
(THALES Avionics, rue Jules Vedrines, 26027 Valence Cedex, FRANCE)

14:10 **Tactical grade MEMS accelerometer**
Stéphan Gonseth, R. Brisson, D. Balmain, M. Di-Gisi
(Safran Colibrys SA, Av. des Sciences, 1400 Yverdons-les-Bains, SWITZERLAND)

14:35 **Advanced Surface Micromachining Process for Inertial Sensors**
Johannes Classen¹, [A. Sorger, J. Mehner]²
¹Robert Bosch GmbH, Automotive Electronics, Tübinger Str., 72762 Reutlingen, GERMANY
²Technische Universität Chemnitz, Reichenhainer Straße, 09107 Chemnitz, GERMANY)

15:00 **Coffee Break (20min)**

Session 3: INERTIAL MEASUREMENT UNITS (CHAIRMAN: T. Löffler)

15:20 **Sharing historic data on tactical-grade MEMS-based IMUs delivered to global customers for almost a decade**
Reidar Holm, Hans Schou, H.R. Petersen
(Sensoror AS, Knudsrodveien 7, 3194 Horten, NORWAY)

15:45 **A Hybrid Grading Calibration Method of FOG-IMU and its Experimental Verification**
Jiachong Chang¹, Bo Zhao², [Fei Yu, Pengfei Wu]¹, [Runfeng Zhang]²
¹Harbin Institute of Technology, School of Electrical Engineering & Automation, Nan Gang District, Harbin, CHINA
²Harbin Institute of Technology, Anshan Industrial Technology Research Institute, Anshan, CHINA)

End: 16:10

Social Event

17:00 Come together @ Meetingpoint (Statue of Fridericiana)
17:15 Bus transfer to the Rhein harbour, MS-Karlsruhe anchorage
18:00 Departure MS-Karlsruhe 2h river cruise
20:00 Return at the anchorage and dinner buffet opening on the MS-Karlsruhe
22:30-23:50 Scheduled bus-transfer back to the KIT every 20 minutes

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PROGRAMME

Wednesday, September 20, 2017

- Session 4: GYROS #2 (CHAIRMAN: W. Geiger)**
- 9:00 **Miniaturization of RLG with Navigation Grade Performance**
Minghui Zhang, Fan Wu, Xing Liu, Jingxian Wang
(AVIC Xi'An Flight Automatic Control Research Institute, Optics Department, Dianziyi Rd, 710065 Xi'An, CHINA)
- 9:25 **Could Cold Atom Interferometry Sensors be the Future Inertial Sensors? First Simulation Results**
Mohamed Bochkaty¹, S. Schön¹, [D. Schlipper, C. Schubert, E. Rasel]²
(Leibniz Universität Hannover, ¹Institut für Erdmessung (ife), ²Institut für Quantenoptik, 30167 Hannover, GERMANY)
- 9:50 **Rigid Motion Reconstruction by Functional Iteration (alternate)**
Yuanxin Wu
(Shanghai Jiao Tong University, Shanghai, 200240, CHINA)
- 10:15 **Thermo-Mechanical Simulation of Die-Level Packaged 3-axis MEMS Gyroscope Performance**
Arnaud Parent¹, C. J. Welham¹, [T. Piirainen, A. Blomqvist]²
(¹Coventor, SARL, Avenue du Québec, 91140 Villebon-sur-Yvette, FRANCE
²Murata Electronics Oy, Myllynkivenkuja, 01621 Vantaa, FINLAND)
- 10:40 **Coffee Break (30min)**
- Session 5: AIDING METHODS / SYSTEMS (CHAIRMAN: J. Wagner)**
- 11:10 **Tightly-coupled GNSS-aided inertial system with modulation rotation of two-antenna measurement unit**
G. I. Emelyantsev^{1,2}, E.V. Dranitsyna¹, I.Yu. Vinokurov¹, A.P. Stepanov^{1,2}, B.A. Blazhnov¹, D.A. Radchenko¹, P.N. Kostin¹, P.Yu. Petrov¹
(¹Concern CSRI Elektropribor, JSC, 30 Malaya Posadskaya ul., St. Petersburg 197046, RUSSIA
²ITMO University, Kronverkskiy pr., St. Petersburg 197101, RUSSIA)
- 11:35 **ISS 2018 conference announcement**
- 11:50 **Lunch break (100min)**
- 13:30 **IMU-based mounting parameter estimation on construction vehicles**
Zsigmond Péntek¹, [T. Hiller, T. Liewald, B. Kuhlmann,]², A. Czmerk³
(¹Robert Bosch Kft., AE/ESI, Gyömroi út, 1103 Budapest, HUNGARY
²Robert Bosch GmbH, AE/EAC1, Tübinger Straße, 72762 Reutlingen, GERMANY
³Budapest University of Technology and Economics, Mechanical Engineering Department, 1111 Budapest, HUNGARY)
- 13:55 **Tightly Coupled Fusion of Direct Stereo Visual Odometry and Inertial Sensor Measurements using an Iterated Information Filter**
Manuel Schwaab¹, [D. Plaia, D. Gaida, Y. Manoli]¹, Y. Manoli²
(¹Hahn-Schickard-Gesellschaft für angewandte Forschung e.V., 78052 Villingen-Schwenningen, GERMANY
²Department of Microsystems Engineering (IMTEK), University of Freiburg, 79110 Freiburg, GERMANY)
- Session 6: APPLICATIONS (E. v. Hinüber)**
- 14:20 **Integrity Monitoring in GNSS/INS Systems by Optical Augmentation**
Alexander Schwithal¹, C. Tonhäuser¹, [S. Wolkow, M. Angermann, P. Hecker]¹, [N. Mumm, F. Holzapfel]²
(¹TU Braunschweig, Institute of Flight Guidance, Hermann-Blenk-Str., 38108 Braunschweig, GERMANY
²Technical University of Munich, Institute of Flight System Dynamics, Boltzmannstrasse, 85748 Garching, GERMANY)
- 14:45 **Coffee Break (30min)**
- 15:15 **MEMS based Navigation and Control of a Nonlinear Quadrotor with Tilttable Rotors**
Georg Scholz¹, Karsten Müller¹, G. F. Trommer^{1,2}
(¹KIT, Institute of Systems Optimization (ITE), Fritz-Haber-Weg, 76131 Karlsruhe, GERMANY
²ITMO University, Kronverkskiy pr., St. Petersburg 197101, RUSSIA)
- 15:40 **LFK-150: Development of a high-accuracy Marine Inertial Reference System**
Uwe Probst, M. Deck, S. Voigt, O. Deppe-Reibold, U. Herberth
(Northrop Grumman LITEF GmbH, Lörracherstr., 79115 Freiburg, GERMANY)
- 16:05 **High End Inertial Systems Market Overview**
Guillaume Girardin
(Yole Développement, MEMS & Sensors, Cours Emile Zola, 69100 Villeurbanne, FRANCE)
- 16:30 **End of Conference**
- Alternate**
- Navigation Informativity of Geophysical Fields in Map-Aided Navigation**
O.A. Stepanov^{1,2}, A.S. Nosov², A.B. Toropov²
(¹ITMO University, St. Petersburg, RUSSIA
²State Research Center of the Russian Federation Concern CSRI Elektropribor, JSC, St. Petersburg, RUSSIA)
- Improvements of Compact Resonator Fiber Optic Gyroscopes**
G. Sanders, E. Benser, L. K. Strandjord, J. Wu, W. Williams, M. Smiciklas, M. Salit, Ch. Narayanan, T. Qiu
(Honeywell International, 21111 N. 19th Avenue, Phoenix, AZ, USA, UNITED STATES)