

2015 DGON Inertial Sensors and Systems (ISS)

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

PROGRAMME

Tuesday, September 22, 2015

- 08:00 Registration
- 09:00 Welcome
- 09:05 ***The ISS Symposium Turns 50: Trends and Developments of Inertial Technology during Five Decades***
Jörg F. Wagner¹, [M. Perlmutter]²
¹University of Stuttgart, Deutsches SOFIA Institut, Stuttgart, **GERMANY**,
²Civitanavi Systems Ltd, Sherborn, MA, **USA**)
- Session 1: Accelerometers (CHAIRMAN: S. Zimmermann)**
- 09:30 ***Quartz Pendulous Accelerometers for Navigation and Tactical Grade Systems***
Jose Beitia¹, [A. Clifford, C. Fell, P. Loisel]¹
¹INNLABS Ltd, Blanchardstown Industrial Park, Blanchardstown, Dublin, **IRELAND**)
- 10:00 ***A New High Performance Sigma-Delta MEMS Accelerometer for Inertial Navigation***
Philippe Ullah¹, [V. Ragot]¹, [P. Zwahlen, F. Rudolf]²
¹Sagem, Argenteuil, **FRANCE**,
²Colibrys, Yverdon-les-Bains, **SWITZERLAND**)
- 10:30 **Coffee Break**
- 11:00 ***Inclinors - Thermodynamic Sensing of Motion***
Stefan Junge¹, [H. Plöchingner]¹, [M. Freund, O. Amft]²
¹Thyracont Vacuum Instruments GmbH, Passau, **GERMANY**,
²University of Passau, ACTLab research group, Passau, **GERMANY**)
- Session 2: Gyroscopes (CHAIRMAN: N. N.)**
- 11:30 ***Development and Evaluation of a Navigation Grade Resonator Fiber Optic Gyroscope***
Glen Sanders¹, Earl Benser², [M. Smickilas, J. Wu]¹, [L. Strandjord]²
¹Honeywell International, Aerospace Advanced Technology, Phoenix, AZ, **USA**
²Honeywell International, Aerospace Advanced Technology, Plymouth, MN, **USA**)
- 12:00 ***Electromechanical and process design of a 3 axis piezoelectric MEMS gyro in GaAs***
Adrien Piot¹, [B. Bourgeteau, O. Le Traon, R. Levy, P. Lavenus, J. Guérard]¹, [I. Roland, N. Isac, A. Bosseboeuf]²
¹Onera – The French Aerospace Lab, Sensors and Microtechnology Unit, Physics and Instrumentation Department, Châtillon, **FRANCE**,
²Université Paris Sud, Institut d'Electronique Fondamentale, UMR 8622, Orsay, **FRANCE**)
- 12:30 **Lunch Break (90min)**
- 14:00 ***A New Versatile Hardware Platform for Closed-Loop Gyro Evaluation***
Ahmed Omar¹, M. Nagib¹, [Elshennawy, A. Ismail, M. Elmala, A. Elsayed]¹
¹Si-Ware Systems, ASIC Solutions Business Unit, Heliopolis, Cairo, **EGYPT**)
- 14:30 ***Continuous-Time Lowpass and Bandpass $\Delta\Sigma$ -Modulators for Closed-Loop Readout Circuits of Capacitive MEMS Gyroscopes***
Stefan Rombach¹, [M. Maurer, Y. Manoli]¹, [Y. Manoli]²
¹University of Freiburg, Fritz Huettinger Chair of Microelectronics, Department of Microsystems Engineering (IMTEK), Freiburg, **GERMANY**,
²HSG-IMIT, Villingen-Schwenningen, **GERMANY**)
- Session 3: Sensor Fusion (CHAIRMAN: G. Trommer)**
- 15:30 ***A Closed-loop Procedure for the Modeling and Tuning of Kalman Filter for FOG INS***
Andrea Pizzarulli¹, Roberto Senatore¹, [A. Benini, D. Orsini, M. Verola, M. Perlmutter]¹
¹Civitanavi Systems S.r.l., Civitanova Marche (MC), **ITALY**)
- 17:20 Come together @ Meeting Point (Statue of Fridericana)
- 17:45 Karlsruhe celebrates 300 anniversary: Guided Tour in Karlsruhe - starting at the Schlossplatz
- 19:30 End Tour – Dinner at the Badisch Brauhaus, a local Micro Brewery
- Alternate:**
- 1. Control and Damping Imperfection Compensation for a Rate Integrating MEMS Gyroscope**
Zhongxu Hu¹, [Barry Gallacher]¹
¹Newcastle University, School of Mechanical & System Engineering, Newcastle upon Tyne, **UNITED KINGDOM**)
- 2. The Development and Evaluation of a Two-Axis Indexing NFFDLG INS for Marine Navigation**
Songlai Han¹, [B. Yuan, J. Tang, G. Lu, Z. Fan]¹
¹National University of Defense Technology, College of Opto-Electronic Science and Engineering, Changsha, **CHINA**)

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Wednesday, September 23, 2015

- Session 3 cont.: Sensor Fusion** (CHAIRMAN: E. v. Hinüber)
- 9:00 **Using the principle of measurement reproduction in federated filters for navigation data processing**
Viktor A. Tupysev¹, Yuliya A. Litvinenko²
(¹Concern CSRI Elektropribor, JSC, St. Petersburg, **RUSSIA**
²ITMO University, Concern CSRI Elektropribor, JSC, St. Petersburg, **RUSSIA**)
- 9:30 **Sensor fusion based vibration estimation using inertial sensors for a complex light-weight structure**
Prashant Kaswekar¹, [J. F. Wagner]¹
(¹University of Stuttgart, Deutsches SOFIA Institut, Stuttgart, **GERMANY**)
- 10:00 **Development of Mapping Position and Orientation Systems with Commercial Grade MEMS**
Val Varavva¹, [J. Hutton, A. Lambert]¹
(¹Applanix Corporation, Richmond Hill, Ontario, **CANADA**)
- 10:30 **Coffee Break**
- 11:00 **A laser and image based navigation and guidance system for autonomous outdoor-indoor transition flights of MAVs**
Manuel Popp¹, [G. Scholz, S. Prophet, G. F. Trommer]¹
(¹Karlsruhe Institute of Technology, Institute of Systems Optimization, Karlsruhe, **GERMANY**)
- Session 4: Simulation and Testing** (CHAIRMAN: T. Löffler)
- 11:30 **On the generation of realistic simulated inertial measurements**
M. Eulàlia Parés¹, [J. A. Navarro]¹, [I. Colomina]²
(¹CTTC - Geomatics Division, Castelldefels - Barcelona, **SPAIN**
²Geonumerics, Castelldefels - Barcelona, **SPAIN**)
- 12:00 **Multi-Sensor vehicle testing: Recording Inertial Sensors via CAN bus in Combination with Recorded GNSS RF signals**
Karen von Hünerbein¹, [P. Argent, T. Schulze]²
(¹Lange-Electronic GmbH, Gernlinden, **GERMANY**
²Spirent Communications plc, Paignton, Devon, **UNITED KINGDOM**)
- 12:30 **Lunch Break (90min)**
- Session 5: Applications** (CHAIRMAN: J.-F. Wagner)
- 14:00 **Development of a Modular Inertial Sensor Package and its Application for Improvement of Handheld Grenade Launcher Accuracy**
Alfons Newzella¹, [M. Weidacher, J. Schoder, F. Gathmann]¹
(¹MBDA-Deutschland GmbH, OPE2-E1, Schrobenhausen, **GERMANY**)
- 14:30 **Dedicated algorithm for line of sight stabilization and orientation**
Loic Davain¹, [Thomas Erler]²
(¹Sagem Défense Sécurité, Avionics Division, Eragny, **FRANCE**
²Sagem Navigation, Murr, **GERMANY**)
- 15:00 **Coffee Break** (CHAIRMAN: W.-Auch)
- 15:30 **A Study of Different Types of IMU Errors in Strapdown Airborne Gravimetry**
David Becker¹, [M. Becker]¹
(¹Technische Universität Darmstadt, Physical and Satellite Geodesy, Darmstadt, **GERMANY**)
- 16:00 **Tuning Fork MEMS Gyroscope for Precision Northfinding**
Burgess Johnson¹, [K. Christ, D. Endean]¹, [B. Mohr, R. Supino]², [H. French]³, [E. Cabuz]⁴
(¹Honeywell International, Aerospace Advanced Technology, Plymouth, MN, **USA**
²Honeywell International, Aerospace Advanced Technology, Golden Valley, MN, **USA**
³CorTech, LLC, (Formerly of Honeywell International, Aerospace Advanced Technology), Plymouth, MN, **USA**
⁴Honeywell International, Aerospace Advanced Technology (Formerly), Plymouth, MN, **USA**)
- Alternate:**
- 1. Sensor Fusion and Transfer Alignment Concept for Pointing and Target acquisition**
Andrea Pizzarulli¹, [Fabrizio D'Angelo, Gianluigi Biancucci, Roberto Senatore, Massimo Verola, Michael Perlmutter]¹
(¹Civitanavi Systems S.r.l., Civitanova Marche (MC), **ITALY**)
- 2. On the Performance of Inertial/GNSS/Doppler Velocity Log Integrated Navigation Systems for Marine Applications**
Michailas Romanovas¹, [R. Ziebold, L. Lança]¹
(¹German Aerospace Centre (DLR), Institute of Communications and Navigation, Department of Nautical Systems, Neustrelitz, **GERMANY**)