

2017 DGON Inertial Sensors and Systems (ISS 2017)

**Karlsruhe, Germany
19 – 20 September 2017**



**IEEE Catalog Number: CFP1757W-POD
ISBN: 978-1-5386-3963-4**

**Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1757W-POD
ISBN (Print-On-Demand):	978-1-5386-3963-4
ISBN (Online):	978-1-5386-3962-7
ISSN:	2377-3464

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

	Reference
Editors Preface	iii
Table of Contents	iv
Author's Index	vii
Next Generation Optical Fibers For Small Diameter Fiber Optic Gyroscope (FOG) Coils	1
<i>A. Gillooly, M. Hill, T. Read, P. Maton</i>	
A Model Building Method of Single-axis Interferometric FOG - Based on Thermally Induced Nonreciprocal Error	17
<i>W. Gao, R. Zhang, P. Wu, B. Zhao, Y. Zhang</i>	
Highest bias stability fiber-optic gyroscope SRS-5000	31
<i>Yu.N. Korkishko, V.A. Fedorov, V.E. Prilutskiy, V.G. Ponomarev, I.V. Fedorov, S.M. Kostritskii, I.V. Morev, D.V. Obuhovich, S.V. Prilutskiy, A.I. Zuev, V.K. Varnakov</i>	
First Steps for a Giant FOG: Searching for the Limits	54
<i>F. Guattari, H. Lefèvre, E. Toldi, A. Bigueur, D. Ponceau, C. Moluçon, E. Ducloux, J. Wassermann and U. Schreiber</i>	
FOG based INS for satellite launcher application	68
<i>D. Grifi, R. Senatore, E. Quatraro, M. Verola, A. Pizzarulli</i>	
Miniature High-Performance Quartz Accelerometer for High-Dynamic, Precision Guided systems	80
<i>J. Beitia</i>	
To the production of a robust and highly accurate MEMS vibrating accelerometer	93
<i>O. Lefort, I. Thomas, S. Jaud</i>	
Tactical grade MEMS accelerometer	112
<i>S.Gonseth, R. Brisson, D. Balmain, M. Di-Gisi</i>	
Advanced Surface Micromachining Process for Inertial Sensors	123
<i>J. Classen, A. Sorger, J. Mehner</i>	

Sharing historical data on tactical-grade MEMS-based IMUs delivered to global customers for almost a decade	137
<i>R. Holm, H. Schou, H. R. Petersen, S. Normann</i>	
A Hybrid Grading Calibration Method of FOG-IMU and its Experimental Verification	153
<i>J. Chang, Bo Zhao, Fei Yu, R. Zhang, P. Wu</i>	
Miniaturization of RLG with Navigation Grade Performance	172
<i>M. Zhang, F. Wu, X. Liu, J. Wang</i>	
Could Cold Atom Interferometry Sensors be the Future Inertial Sensors? – First Simulation Results	185
<i>M. Bochhati, S. Schön, D. Schlippert, C. Schubert, E. Rasel</i>	
Rigid Motion Reconstruction by Functional Iteration	205
<i>Yuanxin Wu</i>	
Thermo-Mechanical Simulation of Die-Level Packaged 3-axis MEMS Gyroscope Performance	221
<i>A. Parent, C. J. Welham, T. Piirainen, A. Blomqvist</i>	
Tightly-Coupled GNSS-Aided Inertial System with Modulation Rotation of Two-Antenna Measurement Unit	231
<i>G. Emel'yantsev, E. Dranitsyna, A. Stepanov, B. Blazhnov, I. Vinokurov, P. Kostin, P. Petrov, D. Radchenko</i>	
IMU-based mounting parameter estimation on construction vehicles	249
<i>Zs. Péntek, T. Hiller, T. Liewald, B. Kuhlmann, A. Czmerk</i>	
Tightly Coupled Fusion of Direct Stereo Visual Odometry and Inertial Sensor Measurements using an Iterated Information Filter	263
<i>M. Schwaab, D. Plaia, D. Gaida, Y. Manoli</i>	
Integrity Monitoring in GNSS/INS Systems by Optical Augmentation	283
<i>A. Schwithal, C. Tonhäuser, S. Wolkow, M. Angermann, P. Hecker N. Mumm, F. Holzapfel</i>	
MEMS based Navigation and Control of a Nonlinear Quadrotor with Tilttable Rotors	305
<i>G. Scholz, K. Müller, G. F. Trommer</i>	
LFK-150: Development of a high-accuracy Marine Inertial Reference System	325
<i>U. Probst, M. Deck, S. Voigt</i>	

Navigatio Informativity of Geophysical Fields in Map-Aided Navigation	342
<i>O.A. Stepanov, A.S. Nosov, A.B. Toropov</i>	
Improvements of Compact Resonator Fiber Optic Gyroscopes	361
<i>G. Sanders, L. K. Strandjord, J. Wu, W. Williams, M. Smiciklas, M. Salit, Ch. Narayanan, E. Benser, T. Qiu</i>	