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State Research Center of the RF
Concern CSRI Elektropribor, JSC
President of International Public Association -
Academy of Navigation and Motion Control
Saint Petersburg, Russia
e-mail: office@eprib.ru

MEMBERS

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President of CSIT
China Aerospace Science and Technology Corporation
Beijing, China
e-mail: casc9@mail.ru

Prof. Igor BELOKONOV
Samara University
Samara, Russia
e-mail: ibelokonov@mail.ru

Dr. Andrei GOLOVAN
Lomonosov Moscow State University
Moscow, Russia
e-mail: aagolovan@yandex.ru

Dr. Dmitry KOSHAEV
State Research Center of the RF
Concern CSRI Elektropribor, JSC
Saint Petersburg, Russia
e-mail: office@eprib.ru

Dr. Yuri LITMANOVICH
State Research Center of the RF
Concern CSRI Elektropribor, JSC
Saint Petersburg, Russia
e-mail: office@eprib.ru

Dr. Boris RIVKIN
State Research Center of the RF
Concern CSRI Elektropribor, JSC
Saint Petersburg, Russia
e-mail: office@eprib.ru

Dr. George T. SCHMIDT
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Dr. Alexander SOKOLOV
State Research Center of the RF
Concern CSRI Elektropribor, JSC
Saint Petersburg, Russia
e-mail: office@eprib.ru

Corresponding Member of RAS
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State Research Center of the RF
Concern CSRI Elektropribor, JSC
Saint Petersburg, Russia
e-mail: office@eprib.ru

Prof. Dr-Ing. habil. Gert F. TROMMER, FRIN
Institute of Systems Control (IRS)
Karlsruhe Institute of Technology (KIT)
Karlsruhe, Germany
e-mail: gert.trommer@kit.edu

Prof. Yuanxin WU
Shanghai Jiao Tong University
School of Electronic Information and Electrical Engineering
Shanghai, China
e-mail: yuanxin.wu@sjtu.edu.cn

SCHEDULE FOR CONFERENCE EVENTS

29 MAY, MONDAY

Registration of the Conference participants	**8.00 – 9.50**
Opening ceremony	**10.00 – 10.15**
Sessions	**10.15 – 13.00**
Lunch	**13.00 – 14.00**
Sessions	**14.00 – 18.15**
Sight-seeing guided tour of St. Petersburg	**18.30 – 21.30**

30 MAY, TUESDAY

Sessions	**9.00 – 13.00**
Lunch	**13.00 – 14.00**
Sessions	**14.00 – 18.05**
Drink reception	**18.30**

31 MAY, WEDNESDAY

Sessions	**10.00 – 11.30**
PANEL DISCUSSION: The Outlook for Gyroscopy	**12.00 – 13.00**
Lunch	**13.00 – 14.00**
PANEL DISCUSSION: The Outlook for Gyroscopy (continued)	**14.00 – 15.10**
Closing ceremony	**15.10 – 15.20**

PROGRAM

MONDAY, 29 MAY

10.00 – 10.15 **O P E N I N G C E R E M O N Y**

SESSION I – INTEGRATED SYSTEMS

Chairmen **Dr. B.S. Rivkin**, ***Russia***
Prof. G.F. Trommer, *Germany*

P L E N A R Y P A P E R S

10.15 – 10.35 1. **V.S. Vyazmin, A.A. Golovan** (*Lomonosov Moscow State University, Moscow, **Russia***)
Scalar and Vector Strapdown Gravimetry on Aircraft and UAV: Methodology of Surveying and Data Processing

10.35 – 10.55 2. **Dongkai Dai, Yuanman Ni, Jiaxing Zheng, Xingshu Wang, Shiqiao Qin** (*National University of Defense Technology, Changsha, **China***)
Improving Deflections of the Vertical Measurement by Using Rotational INS/GNSS Integration

10.55 – 11.25 COFFEE BREAK

P L E N A R Y P A P E R S

11.25 – 11.45 3. **V.F. Ivanov** (*St. Petersburg Branch of JSC NIIAS, St. Petersburg, **Russia***)
High-Precision Positioning System of the Electric Multiple Unit Train of the Fourth Automation Grade

11.45 – 12.05 4. **N.S. Guzhva** (*National University of Science and Technology MISIS, Cognitive Technologies*, *Moscow, **Russia***), **B. Ali**, **K.S. Bakulev** (*National University of Science and Technology MISIS, Moscow, **Russia**); **R.N. Sadekov** (*Cognitive Technologies*, *National University of Science and Technology MISIS, Moscow, **Russia***), **A.V. Sholokhov** (*Institute of Engineering Physics, Serphukov, **Russia***)
Evaluating the Accuracy of Tram Positioning System in High-Rise Building Environment Using Data from Visual Geoinformation Systems

POSTER PAPERS[1]

12.05 – 13.00

5. **N.N. Vasilyuk** (*Electrooptika, Moscow, **Russia***)
Accumulation of Motion-Blurred Star Images Obtained by a Strapdown Astroinertial Navigation System under Daytime Conditions

6. **Chen Xu** (*Beijing Institute of Aerospace Control Devices, Beijing, **China***), **Li-Ming Cai, Xue-Jiao Sun, Qing-Zhou Li, (***Beijing Institute of Aerospace Control Devices, Beijing; Aero-Times Marine Equipment Technology Development Co., Qingdao, **China),** **Chang-Qing Hu (***Beijing Institute of Aerospace Control Devices, China Aerospace Science and Technology Corporation, Beijing; Aero-Times Marine Equipment Technology Development Co., Qingdao, **China),***
Research on Navigation and Positioning Technology for Autonomous Recovery of Unmanned Surface Vehicles

7. **D.I. Smolyanov** (*Lomonosov Moscow State University, JSC Cognitive, Moscow, **Russia***), **A.A. Golovan** (*Lomonosov Moscow State University, **Russia***)
On the Problem of Navigation of Unmanned Wheeled Agricultural Machinery Using MEMS-Based INS, GNSS and Odometry

8. **A.V. Prohortsov, O.S. Balabaev** (*Tula State University, **Russia***)
Method for Determining the Navigation Parameters of an Automatic Mining Machine

9. **Yuanman Ni, Dongkai Dai, Wenfeng Tan, Xingshu Wang, Shiqiao Qin** (*National University of Defense Technology, Changsha, **China***)
Installation Error Calibration Method of Stellar/Inertial Integrated Navigation System for Star Tracker with Narrow Field of View

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10. **A.V. Shurygin** (*Institute of Automation and Control Processes FEB RAS, Vladivostok,* ***Russia***)
Mathematical Models and Algorithms of the Onboard Multiposition Integrated Inertial-Satellite Motion Detection System

11. **M.Yu. Tkhorenko, E.V. Karshakov, I.A. Papusha** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow,* ***Russia***)
Inertial Navigation Aiding by the Means of Magnetic Measurements

12. **A.V. Chernodarov** (*NaukaSoft Research & Production Association, Ltd., Moscow,* ***Russia***), **V.N. Kovregin, G.M. Kovregina** (*St. Petersburg State University of Aerospace Instrumentation,* ***Russia***)
Inertial-Satellite Micronavigation System for Radar with Synthetic Aperture and Doppler Channel for Measuring Trajectory Velocity

13. **V.A. Smirnov, A.V. Prokhortsov, N.I. Babukhin** (*Tula State University,* ***Russia***)
An Algorithm for Orientation and Navigation of a Moving Object Based on Image Processing from Several Optical Sensors

14. **M.O. Uss** (*ETMC Exponenta, Moscow,* ***Russia***)
Concept of Developing a Digital Twin of a Ground-Based Navigation System

15. **J. Yi, M.S. Selezneva, K.A. Neusypin, J. Zheng** (*Bauman Moscow State Technical University, Moscow,* ***Russia***)
Application of the Self-Organization Algorithm with the Trend Redundancy in Navigation and Mapping of the Vehicle

16. **A.A. Penkovsky, J. Mahmoud, M. Mohrat, S.A. Kolyubin** (*ITMO University, St. Petersburg,* ***Russia***)
Robust Visual-Inertial Odometry for Ground Robots in Dynamic Environments

The paper is recommended by the Program Committee of the 25th Anniversary Conference of Young Scientists "Navigation and Motion Control"

17. **V.G. Karaulov, A. M. Gruzlikov** (*Concern CSRI Elektropribor, JSC, St. Petersburg,* ***Russia***), **V.P. Zolotarevich** (*Concern CSRI Elektropribor, JSC; ITMO University, St. Petersburg,* ***Russia***)
Recurrent Algorithm for Positioning and Determining the Orientation of AUV

The paper is recommended by the Program Committee of the 25th Anniversary Conference of Young Scientists "Navigation and Motion Control"

18. **N.V. Kuzmina, S.M. Tarasov, V.V. Tsodokova** (*Concern CSRI Elektropribor, JSC, St. Petersburg,* ***Russia***)
Algorithmic Compensation of Automated Astronomical Theodolite Errors Due to Data Synchronization Failures

The paper is recommended by the Program Committee of the 25th Anniversary Conference of Young Scientists "Navigation and Motion Control"

13.00 – 14.00 LUNCH

Chairmen: **Prof. O.A. Stepanov, Corresponding member of RAS,** ***Russia***
O.V. Zaitsev, Ph.D., ***Russia***

PLENARY PAPERS

14.00 – 14.20 19. **A.V. Sokolov, O.A. Stepanov, A.V. Motorin, A.A. Krasnov** (*Concern CSRI Elektropribor, JSC; ITMO University, St. Petersburg,* ***Russia***)
Comparison of Wiener and Kalman Filters in Processing the Results of Marine Gravimetric Survey

14.20 – 14.40 20. **Yingwei Zhao, Shiqiao Qin, Xingshu Wang, Jiaxing Zheng, Lin Wang** (*National University of Defense Technology, Changsha,* ***China***)
LDV/INS Integrated Navigation Aided by Map Matching

14.40 – 15.00 21. **A.V. Bragin, Yu.V. Bolotin** (*Lomonosov Moscow State University,* ***Russia***)
Novel Aiding Algorithm for Autonomous Pedestrian Navigation

POSTER PAPERS[1]

15.00 – 15.50

22. **A.V. Astafiev** (*Vladimir State University, Murom, **Russia***), **O.V. Zaitsev** (*Concern CSRI Elektropribor, JSC, St. Petersburg, **Russia***), **R.N. Sadekov** (*National University of Science and Technology MISIS, Moscow*, ***Russia***)
Indoor Localization of the Radio Devices Based on Channel State Information Using a Restricted Boltzmann Machine

23. **V.A. Petrukhin, K.S. Lelkov, A.I. Chernomorsky** *(Moscow Aviation Institute, **Russia***)
Local Navigation of a Wheeled Mobile Robot as a Carrier of Equipment for Aircraft Defects Monitoring at the Parking Lot

24. **L.A. Martynova** (*Concern CSRI Elektropribor, JSC, St. Petersburg, **Russia***), **K.V. Lantsov, V.V. Lantsov, A.V. Koryakin** (*GosNIIP JSC, Moscow, **Russia***)
A Method of a Small-Sized Robotic System Direction Finding Using a Mobile Observer in Rugged Topography Conditions

25. **V.I. Baburov** (*Navigator JSC, St. Petersburg, **Russia***), **N.V. Ivantsevich** (*Navigator JSC, D.F. Ustinov Baltic State Technical University Voenmeh, St. Petersburg, **Russia***), **V.V. Khudoshin** (*Navigator JSC, St. Petersburg, **Russia***)
Operation of an Aircraft Collision Avoidance System for Relative Navigation

26. **I.A. Kopylov, E.G. Kharin, V.A. Kopelovich, A.F. Yakushev, L.L. Lovitskiy, E.R. Stepanova** (*Gromov Flight Research Institute, Zhukovsky, **Russia***)
Evaluation of Enhanced Ground Proximity Warning System Through Flight Trials

27. **Yu.V. Yasyukevich** (*Institute of Solar-Terrestrial Physics SB RAS, Irkutsk, **Russia***), **V.V. Demyanov** (*Institute of Solar-Terrestrial Physics SB RAS, Irkutsk State Transport University, Irkutsk, **Russia***)
Space Weather Impact on the Global Navigation Satellite Systems Operation: Current State

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28. **A.L. Tolstoy, S.D. Petrov, P.V. Movsesyan** (*St. Petersburg State University, **Russia***), **I.V. Chekunov** (*Bauman Moscow State Technical University, **Russia***), **D.A. Trofimov** (*St. Petersburg State University, **Russia***)
Resolution of Integer Phase Ambiguity in the Absolute Coordinate Determination from Satellite Radio Navigation Measurements

29. **V.B. Pudlovskiy** (*Russian Metrological Institute of Technical Physics and Radio Engineering VNIIFTRI, Mendeleevo, **Russia***), **A.P. Malyshev, S.A. Serov, S.V. Chernyh** (*Moscow Power Engineering Institute, **Russia***), **A.A. Frolov** (*Russian Metrological Institute of Technical Physics and Radio Engineering VNIIFTRI, Mendeleevo, **Russia***)
Synchronization of Time Scales of Local Navigation Systems and GNSS for "Seamless" Navigation in Urban Conditions

30. **V.I. Baburov, N.V. Vasilyeva** (*Navigator JSC, St. Petersburg, **Russia***), **N.V. Ivantsevich** (*Navigator JSC, D.F. Ustinov Baltic State Technical University Voenmeh, St. Petersburg*, ***Russia***)
Analysis of the Positioning Accuracy Using Two Satellite Navigation Systems under the Conditions of User Rolls

15.50 – 16.20 COFFEE BREAK

PLENARY PAPERS

16.20 – 16.40 31. **D.V. Akulin, M.V. Mentyukov, S.A. Nozdrin** (*Special Technology Center, St. Petersburg, **Russia***)
Nadir Finding System with Infrared Temperature Sensors for CubeSat Satellites **CANSELED**

16.20 – 16.40 32. **S.B. Berkovich, N.I. Kotov, A.V. Sholohov, R.R. Bikmaev** (*Institute of Engineering Physics, Serpukhov, **Russia***)
Place Recognition Using a Siamese Neural Network in the Problem of Simultaneous Localization and Mapping with Sparse Sensing

16.40 – 17.00

33. **O.A. Stepanov** (*Concern CSRI Elektropribor, JSC; ITMO University, St. Petersburg, **Russia***)**, V.A. Vasil'ev** *(Concern CSRI Elektropribor, JSC; ITMO University; Electrotechnical University LETI, St. Petersburg, **Russia***)**, Yu.A. Litvinenko, A.M. Isaev** *(Concern CSRI Elektropribor, JSC; ITMO University, St. Petersburg, **Russia**)*
Map-Aided Navigation Using the A Priori Information on the Object Trajectory

POSTER PAPERS[1]

17.00 – 17.55

34. **K.B. Amelin** *(Navigator JSC; St. Petersburg State University of Aerospace Instrumentation, St. Petersburg, **Russia***)**, A.R. Bestugin, I.A. Kirshina** *(St. Petersburg State University of Aerospace Instrumentation, **Russia***), **A.A. Rogova** (*Navigator JSC, St. Petersburg, **Russia***), **O.I. Sauta, P.A. Semenov** *(Navigator JSC; St. Petersburg State University of Aerospace Instrumentation, **Russia***)
Characteristics of the Satellite System for Landing an Aircraft on a Mobile Platform When Stabilizing the Glide Path Using Microelectromechanical Sensors

35. **S.S. Smirnov, S.D. Petrov** (*St. Petersburg State University, **Russia***), **I.V. Chekunov** (*Bauman Moscow State Technical University, **Russia***), **D.A. Trofimov** (*St. Petersburg State University, **Russia***)
Local Ranging Code Based Radionavigation System

36. **O.S. Amosov, S.G. Amosova** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, **Russia***)
Fractional Kalman Type Filters for Estimating the State, Parameters, and Order of Fractional Dynamical System in Problems of Navigation Information Processing

37. **Y.N. Adyakin, V.A. Orlov, A.P. Shvedov, V.A. Borisov, A.V. Ladonkin** (*NPO Strela, Tula, **Russia***), **D.M. Malyutin** (*Tula State University,* **Russia**)
Payload Orientation System

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38. **V.N. Kovregin**, **G.M. Kovregina** (*St. Petersburg State University of Aerospace Instrumentation,* ***Russia***)
Method for Adaptive-Robust All-Angle Observation of an Air Object with an Extended Range of Relative Speeds in a Radar with Quasi-Continuous Chirp Radiation

39. **V.N. Kovregin**, **G.M. Kovregina** (*St. Petersburg State University of Aerospace Instrumentation,* ***Russia***)
Method for Observing a Hovering Object against the Background of the Earth in Radars with Quasi-Continuous Chirp Radiation

40. **A.V. Nebylov, V.A. Nebylov** (*St. Petersburg State University of Aerospace Instrumentation,* ***Russia***)
Development of Concepts for the Design of Heavy Ekranoplanes in Russia and USA

41. **A.V. Prokhortsov, V.A. Smirnov, O.V. Minina** (*Tula State University,* ***Russia***)
Methods of Data Fusion in Integrated Navigation Systems Based on Signals from a Limited Number of Navigation Satellites

42. **S.V. Kravchuk, A.B. Petrov, M.A. Shatskiy, I.V. Solov'ev** (*Moscow Experimental Design Bureau MOKB Mars–Branch of Dukhov Russian National Research Institute of Automation, Moscow,* ***Russia***)
Computer Aided Design of Application Software for Integrated Navigation Systems

43. **D.G. Gryazin** (*Concern CSRI Elektropribor, JSC; ITMO University, St. Petersburg,* ***Russia***), **T.V. Paderina** (*Concern CSRI Elektropribor, JSC, St. Petersburg,* ***Russia***)
Experience in Development of a Magnetic Compass Correction System

44. **A.N. Alexeev, E.S. Zemlyanyy, K.A. Chekanov** (*JSC Ramenskoye Design Company, Ramenskoye,* ***Russia***)
Solving the Problem of Unmanned Aerial Vehicle Automatic Runway Landing

18.10 – 21.10 **Sight-seeing guided tour of the city**

TUESDAY, 30 MAY

SESSION II – INERTIAL SYSTEMS AND SENSORS

Chairmen: **Prof. A.A. Golovan, *Russia***
N.G. Skidanov, Ph.D., *Russia*

PLENARY PAPERS

9.00 – 9.20 45. **A.G. Kuznetsov** (*Moscow Institute of Electromechanics and Automatics, **Russia***), **A.V. Kozlov, V.M. Zheleznov** (*Lomonosov Moscow State University, **Russia***), **A.V. Fomichev, A.V. Molchanov** (*Moscow Institute of Electromechanics and Automatics, **Russia***)
On Guaranteeing Tolerances for Strapdown INS Instrumental Errors

9.20 – 9.40 46. **D.B. Pazychev** (*Integral Ltd, Moscow, **Russia***), **K.S. Bakulev** (*National University of Science and Technology MISIS, Moscow, **Russia***), **R.N. Sadekov** (*Cognitive Technologies, Moscow, **Russia***)
Low-Cost Navigation System for UAV

POSTER PAPERS[1]

9.40 – 10.30 47. **Xiaoge Ning** (*Shanghai Jiao Tong University, Shanghai, Beijing, Aerospace Times Optical-electronic Co. Ltd, Beijing, **China***), **Jixun Huang** (*Beijing Institute of Aerospace Control Devices, Beijing, **China***), **Jianxun Li** (*Shanghai Jiao Tong University, Shanghai, **China***)
Influence of the Kalman Filtering Initial Setting on SINS Initial Alignment and an Improved Method for the Alignment of Large Misalignment Angles

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48. **N. Vavilova, A. Golovan, A. Kozlov, I. Papusha** (*Lomonosov Moscow State University, **Russia***), **V. Pavlinov, A. Kulikova, M. Shafeyev, A. Efimochkin, T. Rashkina** (*Ulyanovsk Instrument Manufacturing Design Bureau, **Russia***)
Attitude and Heading Reference System Based on Microelectromechanical Sensors: Development and Testing Results

49. **S.V. Smirnov, A.I. Karachkov, Yu.G. Egorov, M.N. Silchuk, G.Yu. Kiryachenko, G.S. Taranenko** (*Central Research Institute of Automation and Hydraulics, Moscow, **Russia***)
Review and Comparative Analysis of Algorithms for Compensation of Methodological Errors Due to Non-Commutative Phenomena

50. **L.V. Vodicheva, Yu.V. Parysheva, Ya.S. Savel'eva** (*Academician N.A. Semikhatov Scientific and Production Association of Automatics, Yekaterinburg, **Russia***)
Comparative Analysis of Algorithms for Initial Alignment of a Strapdown INS with the Help of a Gimballed INS

51. **Da Li** (*Tianjin Navigation Instrument Research Institute, Laboratory of Science and Technology on Marine Navigation and Control of China State Shipbuilding Corporation, Tianjin, Harbin Engineering University, Harbin, **China**),* **Cheng Suo Li, Wei Gao** (*Tianjin Navigation Instrument Research Institute, Tianjin, **China**),* **Zhong Li, Zi Shan Zhang (***Tianjin Navigation Instrument Research Institute, Laboratory of Science and Technology on Marine Navigation and Control of China State Shipbuilding Corporation, Tianjin, **China***)**, Yuan Yuan** (*Sun Yat-Sen University, Zhuhai*, *Laboratory of Science and Technology on Marine Navigation and Control of China State Shipbuilding Corporation, Tianjin, **China***)
System-Level Calibration Method for Drift of Rotary Accelerometer Gravity Gradiometer

52. **A.V. Chernodarov, A.P. Patrikeev** (*NaukaSoft Research & Production Association, Ltd., Moscow, Russia),* **S.P. Starostin** (*Ramenskoye Design Company, Ramenskoye, Moscow Region,* ***Russia***)
Investigation of the Emergency Mode of the SINS-500NS Strapdown Inertial-Satellite Navigation System Based on Flight Data

53. **M.E. Rulev, V.M. Achil'diev** (*Scientific Production Company GEOFIZIKA-NV, Moscow, Mytischi Branch of Bauman Moscow State Technical University, Mytischi,* ***Russia***), **Yu.K. Gruzevich** (*Scientific Production Company GEOFIZIKA-NV, Bauman Moscow State Technical University, Moscow,* ***Russia***), **N.A. Bedro** (*Scientific Production Company GEOFIZIKA-NV, Moscow,* ***Russia***)
Development of an Error Model for an Electroseismocardiography System

54. **B.V. Klimkovich** (*OKB TSP, Minsk, Republic of* ***Belarus***)
Calibration of SINS by Specific Force Differences

55. **P.A. Akimov, A.I. Matasov** (*Lomonosov Moscow State University,* ***Russia***)
Algorithm of a Gyro Unit Calibration as a Solution to a Minimax Problem

56. **A.A. Fedotov, S.Yu. Perepelkina** (*Academician N.A. Semikhatov Scientific and Production Association of Automatics, Yekaterinburg,* ***Russia***)
Improving the Performance of Strapdown Inertial Navigation Systems Using Typical Angular Motions

10.30 – 11.00 COFFEE BREAK

PLENARY PAPERS

11.00 – 11.20 57. **Xiangyuan Li, Shiqiao Qin, Xingshu Wang, Wenfeng Tan, Jiaxing Zheng, Yingwei Zhao** (*National University of Defense Technology, Changsha,* ***China***)
Multi Inertial Navigation System Fusion Method Considering Ship Deformation

11.20– 11.40 58. **Zhonghong Liang, Yuanhan Wang, Zhikun Liao, Honggang Guo, Hui Luo, Lin Wang** (*National University of Defense Technology, Changsha,* ***China***)
A Novel Calibration Method Between Two Marine Rotational Inertial Navigation Systems Based on State Constraint Kalman Filter

POSTER PAPERS[1]

11.40 – 13.00 59. **Zerun Zang, Wei Hong, Xudong Hu** (*No.16 Institute The 9th Academy China Aerospace Science and Technology Corporation, Xi'an,* ***China***), **Hanrui Yang** (*Northeast Electric Power University, Jilin,* ***China)***, **Shitao Ji, Zijun Pan, Mianzhi Zhang, Yuan Zhou** (*No.16 Institute The 9th Academy China Aerospace Science and Technology Corporation, Xi'an,* ***China***)
Research on Dead Zone Suppression of Fiber Optic Gyroscope Based on Cross-Coupling Intensity Calibration

60. **M.A. Belousov, A.I. Krivosheev** (*Scientific and Technical Center Perm Scientific-Industrial Instrument Making Company,* ***Russia***)
Compensation of Excess Intensity Noise of a Light Source in a Fiber-Optic Gyroscope

61. **Longgang Li, Zijun Pan, Yihua Wang, Honggang Chen, Pei Zhang, Peng Li, Shitao Ji, Bin Ren** (*Xi'an Aerospace Precision Electromechanical Institute, China Aerospace Science and Technology Corporation, Xi'an,* ***China***)
Effect of Different Adhesives for the Fiber Coil with Skeleton on FOG Scale Factor Temperature Sensitivity

62. **Ya.A. Zubarev** (*POLYUS Research Institute, Moscow,* ***Russia***), **A.O. Sinelnikov** (*GosNIIP JSC, RUDN University, Moscow,* ***Russia***), **D.A. Tereshchenko** (*POLYUS Research Institute, Bauman Moscow State Technical University, Moscow,* ***Russia***)
Accelerated Testing of Ring Laser Gyroscope Persistence

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63. **S.I. Nazarov, A.O. Sinelnikov, N.V. Tikhmenev, A.A. Ushanov** (*GosNIIP JSC, Moscow, **Russia***)
Interaction of a Laser Gyroscope Vibration Drive with an External Mechanical Disturbance

64. **M.V. Chirkin, V.Yu. Mishin, A.E. Serebryakov** (*Ryazan State Radio Engineering University, **Russia***), **A.V. Molchanov** (*Moscow Institute of Electromechanics and Automatics, **Russia***), **Yu.R. Ivanenko, G.V. Davydov** (*Ryazan State Radio Engineering University, **Russia***)
Suppression of Laser Gyroscope Random Error without Dither Noising

65. **Yu.Yu. Broslavets, E.A. Polukeev** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny, **Russia***), **D.S. Redichkina** (*Moscow Institute of Physics and Technology, **Russia***), **A.A. Fomichev, V.G. Semenov** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny, **Russia***), **A.S. Nazarova** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny, **Russia***)
Noise Suppression during Mode-Locking in a Laser Gyroscope Based on a Semiconductor Optical Amplifier with a Long Fiber Cavity

66. **Yu.Yu. Broslavets, E.A. Polukeev** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny, **Russia***), **D.S. Redichkina** (*Moscow Institute of Physics and Technology, **Russia***), **A.A. Fomichev, V.G. Semenov** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny, **Russia***), **A.S. Nazarova** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny, **Russia***)
Coupling of Counterpropagating Waves through Scattering by Elements of a Nonplanar Symmetric Resonator of a Four-Frequency Zeeman Laser Gyroscope

67. **Yu.Yu. Broslavets, E.A. Polukeev** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny,* ***Russia***), **D.S. Redichkina** (*Moscow Institute of Physics and Technology,* ***Russia***), **A.A. Fomichev, V.G. Semenov** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny,* ***Russia***), **A.S. Nazarova** (*Moscow Institute of Physics and Technology, JSC Lasex, Dolgoprudny,* ***Russia***)
Factors Affecting the Accuracy of a Solid-State Laser Gyroscope with Mode-Locking

68. **Jiayang Sun, Haoyu Gu, Bowen Xing, Qi Wei, Bin Zhou** (*Tsinghua University, Beijing,* ***China***)
An Improved Least Mean Square Demodulator Based on Adaptive Moment Estimation Algorithm for LFM MEMS Gyroscope

69. **A.E. Morozov, M.A. Belousov, D.Yu. Zobachev** (*Scientific and Technical Center Perm Scientific-Industrial Instrument Making Company,* ***Russia***)
Methodology for Determining the Delays in Sensor Measurements in Navigation Systems

70. **D.M. Kalikhman, L.Ya. Kalikhman, V.A. Turkin** (*Branch of Academician Pilyugin Center – Production Association Korpus, Saratov,* ***Russia****)*
Universal Methodology for Monitoring IMU Parameters in SINS with Non-Orthogonal Orientation of the Measurement Axes

71. **Yu.V. Ivshina** (*Perm National Research Polytechnic University,* ***Russia***), **D. Yu. Zobachev, T.A. Ulianovskaia** (*Scientific and Technical Center Perm Scientific-Industrial Instrument Making Company,* ***Russia***)
Research of Influence of Motion Simulator Geometric Errors on Navigation System Calibration

72. **P.N. Nikolaev, A.S. Espinoza Valles, M.S. Shcherbakov** *(Samara University,* ***Russia****)*
Calibration of Onboard Magnetometers of the SamSat-ION Nanosatellite

73. **A.V. Frolov, P.A. Shapovalov, Yu.V. Mikhaylov** (*Central Research Institute of Automation and Hydraulics, Moscow,* ***Russia***)
Development of a Technique for Design and Optimization of the Bearing Structure of a Strapdown Inertial Navigation System

74. **N.D. Bogdanov, M.A. Belousov** (*Scientific and Technical Center Perm Scientific-Industrial Instrument Making Company,* ***Russia***)
Configurable Shock Absorption System of the Sensor Block

The paper is recommended by the Program Committee of the 25th Anniversary Conference of Young Scientists "Navigation and Motion Control"

13.00 – 14.00 LUNCH

Chairmen: **Prof. Yu.V. Filatov,** ***Russia***
Yu.A. Litvinenko, Ph.D., ***Russia***

PLENARY PAPERS

14.00 – 14.20 75. **Xudong Hu, Wei Hong, Zerun Zang, Zijun Pan, Xiong Yang, Kaixu Liang, Mianzhi Zhang, Xinliang Jia** (*No.16 Institute The 9th Academy China Aerospace Science and Technology Corporation, Xi'an;* ***China****),* **Hanrui Yang (***Northeast Electric Power University, Jilin,* ***China***)
Theoretical Analysis and a New Optical Scheme for RIN Subtraction

14.20 – 14.40 76. **Yu Bai, Wei Hong, Honggang Chen, Bo Huang, Hui Cao, Yongliang Zhao, Yichen Wu, Zerun Zang, Mianzhi Zhang** (*Xi'an Aerospace Precision Electromechanical Institute, China Aerospace Science and Technology Corporation, Xi'an,* ***China***)
Influence of Digital Temperature Control Circuit on Starting Time

POSTER PAPERS[1]

14.40 – 16.10

77. **Libin Zeng, Yao Pan, Xingyuan Tang, Yunfeng Tao, Jianping Liu, Hui Luo** (*National University of Defense Technology, Changsha,* ***China***)
Investigation on Influence of Geometric Error and Structure on Vibrational Characteristics of Hemispherical Resonator

78. **A.A. Skripkin** (*Yuri Gagarin State Technical University of Saratov,* ***Russia***), **S.E. Perelyaev** (*Ishlinsky Institute for Problems in Mechanics RAS, Moscow,* ***Russia***),
To the Design Version of the Spatial Integrating Wave Solid-State Gyroscope

79. **S.E. Perelyaev** (*Ishlinsky Institute for Problems in Mechanics RAS, Moscow,* ***Russia***), **A.V. Alekhin** (*JSC Inertial Technologies of Technocomplex, Ramenskoye,* ***Russia***)
Influence of Non-Identity of WSG Information Channels in the Whole-Angle Mode

80. **S.E. Perelyaev** (*Ishlinsky Institute for Problems in Mechanics RAS, Moscow,* ***Russia***), **A.V. Chernodarov, A.P. Patrikeev** (*NaukaSoft Research & Production Association, Ltd., Moscow,* ***Russia***)
Correlation Signal Processing and Structural-Parametric Identification of a Dynamic Error Model of a Wave Solid-State Gyro

81. **Zhennan Wei, Yiwei Sun, Gouxing Yi , Boqi Xi , Changhong Wang** (*Space Control and Inertial Technology Research Center, Harbin Institute of Technology (HIT), Harbin,* ***China***)
Analysis of Standing Wave Vector Control Error and Its Suppression Method for Rate Integrating Hemispherical Resonator Gyro

82. **V.V. Matveev, A.V. Kalikanov, M.G. Pogorelov, V.V. Lihosherst, M.N. Kirsanov, D.S. Streltsov** (*Tula State University,* ***Russia***)
Implementation of the Free Wave Mode in Coriolis Vibrating Gyroscopes with Low-Q Resonators

[1] *The authors of poster papers* ***at the plenary session*** *are given 3 min* ***to present the main idea of the paper*** *with 1-2 slides, if any; 2 min are given for Q&A (1-2 questions). In case of in-person participation the further discussion will continue at the posters.*

83. **V.Ya. Raspopov, S.V. Egorov** (*Tula State University, **Russia***)
Theory and Practice of Developing a Wave Solid-State Gyroscope with a Metal Resonator

84. **A.A. Maslov, D.A. Maslov, I.V. Merkuryev** (*Moscow Power Engineering Institute, Moscow, **Russia***)
The Effect of the Reference Voltage on the Drift of a Wave Solid-State Gyroscope with Flat Electrodes

85. **V.V. Matveev, D.S. Streltsov, A.V. Kalikanov** (*Tula State University, **Russia***)
Method for Implementing A Self-Oscillatory Circuit in a Wave Solid-State Gyroscope

The paper is recommended by the Program Committee of the 25th Anniversary Conference of Young Scientists "Navigation and Motion Control"

86. **S.G. Shtek, M.A. Zheglov, V.V. Belyakov, O.G. Andreasyan, S.O. Vasetsky, P.S. Kuznetsov** (*GOSNIIP JSC, Moscow, **Russia***)
Development of Sensitive Element of Micro-Opto-Electromechanical Accelerometer

87. **Guangyi Shi** (*Peking University, Chinese University of Hong Kong, **China***)
Inertial Sensors Development and Applications

88. **A.N. Shevchenko** *(Concern CSRI Elektropribor, JSC, St. Petersburg, **Russia***)
Investigation of the Effect of Magnetic Field Inhomogeneity on the Nuclear Magnetic Resonance Gyroscope Self-Oscillating Operating Mode

89. **A.S. Zavitaev, M.I. Evstifeev** *(Concern CSRI Elektropribor, JSC; ITMO University, St. Petersburg, **Russia***)
Analysis of Technological Factors in the Design of a Nuclear Magnetic Gyroscope

The paper is recommended by the Program Committee of the 25th Anniversary Conference of Young Scientists "Navigation and Motion Control"

90. **V.V. Chalkov, G.V. Bezmen** *(Concern CSRI Elektropribor, JSC, St. Petersburg,* ***Russia***)
Methods to Improve the Initial Setup of Nuclear Magnetic Gyroscope Optical Circuit

The paper is recommended by the Program Committee of the 25th Anniversary Conference of Young Scientists "Navigation and Motion Control"

91. **Shixuan Gao** *(Beijing Institute of Aerospace Control Device, Beijing,* ***China***), **Jianpeng Wang (***Beihang University, Beijing,* ***China)*****, Naikun Gao, Jie Xu, Kai Yuan Liu, Xue Rui** *(Beijing Institute of Aerospace Control Device, Beijing,* ***China***)
Research on the Anti-Interference Closed-Loop Control System for Micro Silicon Resonant Accelerometer

92. **N.S. Karanin** *(Concern CSRI Elektropribor, JSC, St. Petersburg,* ***Russia***), **O.S. Yulmetova** *(Concern CSRI Elektropribor, JSC; ITMO University, St. Petersburg,* ***Russia***)
Modeling the Thermal Processes of Deep Reactive Ion Etching of MEMS Accelerometer Sensitive Element

The paper is recommended by the Program Committee of the 25th Anniversary Conference of Young Scientists "Navigation and Motion Control"

93. **P.A. Filatov** (*Moscow Institute of Physics and Technology, JSC* ***Russia***), **A.A. Fomichev** (*Moscow Institute of Physics and Technology, JSC LASEX, Dolgoprudny,* ***Russia***), **P.V. Larionov, A.B. Kolchev** (*JSC LASEX, Dolgoprudny,* ***Russia***), **A.B. Tarasenko** (*Moscow Institute of Physics and Technology, JSC,* ***Russia***)
Q-Flex Accelerometer Error Correction Method Based on Support Vector Machine

94. **A.V. Bolshakova, A.M. Boronakhin, E.D. Bokhman, D.Yu. Larionov, L.N. Podgornaya, A.N. Tkachenko, R.V. Shalymov** (*St. Petersburg Electrotechnical University LETI,* ***Russia***)
Using Wavelet Transform to Analyze Railway Car Dynamics within Inertial Sensor Data

95. **D.M. Kalikhman, E.A. Deputatova** (*Branch of Academician Pilyugin Center – Production Association Korpus, Saratov,* ***Russia***), **S.V. Pchelintseva, V.O. Gorbachev** (*Yuri Gagarin State Technical University of Saratov,* ***Russia***)
All-Purpose Precision Test Bench with Inertial Sensing Elements and Aerostatic Suspension for Angular Rate Sensors

96. **D.M. Malyutin** (*Tula State University,* ***Russia***), **Yu.N. Adyakin, V.A. Orlov, A.P. Shvedov** (*NPO Strela, Tula,* ***Russia***)
Channel Dynamics of the Controllable Indicator Gyrostabilizer for Surveillance Object Line-Of-Sight Angular Rate Measurement

97. **V.A. Pogorelov, E.G. Chub** *(Don State Technical University, Rostov-on-Don,* ***Russia***)
Autonomous Estimation of the Stochastic State Vector of Unaided Gyrostabilized Platform

16.10 – 16.40 COFFEE BREAK

SESSION III – CONTROL SYSTEMS

Chairmen: **Prof. I.V. Belokonov, *Russia***
Dr. E.V. Karshakov, *Russia*

PLENARY PAPER

16.40 – 17.00 98. **M.Yu. Belyaev, P.A. Borovikhin, A.M. Esakov, D.Yu. Karavaev, I.V. Rasskazov** (*S.P. Korolev Rocket and Space Corporation Energia, Korolev, **Russia***)
New Methods of Steering Scientific Instruments to Point Them towards Survey Targets in the Uragan Experiment onboard the ISS

POSTER PAPERS[1]

17.00 – 18.05 99. **A.Yu. Knyazhsky, A.V. Nebylov** (*St. Petersburg State University of Aerospace Instrumentation*, ***Russia***)
Method for Landing an Orbital Aircraft on a Low-Flying Vehicle with a Dynamic Principle of Support

100. **Jingzhong Zheng**, **M.S. Selezneva**, **K.A. Neusypin**, **Ruiyang Zhou** (*Bauman Moscow State Technical University, **Russia***)
Adaptive Super-Twisting Sliding Mode Attitude Control for Moving Mass-Actuated Unmanned Aerial Vehicles

101. **Yu.S. Zaitseva, B.R. Andrievsky** (*Institute for Problems in Mechanical Engineering of RAS, St. Petersburg State University, St. Petersburg, **Russia***)
Preventing String Instability in Altitude Control System of UAV by Nonlinear Correction

102. **Ye.I. Somov, S.A. Butyrin, T.E. Somova** (*Samara State Technical University, **Russia***)
Autonomous Guidance and Control of Mini-Satellites in a Low-Orbit Constellation during Areal Scanning Survey

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103. **Ye.I. Somov, S.A. Butyrin, S.E. Somov** (*Samara State Technical University,* ***Russia***)
Control of a Space Robot Approaching Mini-Satellites in Low-Orbit Earth Survey Constellation

104. **E.V. Barinova, N.A. Elisov, A.V. Kramlikh, I.A. Lomaka** *(Samara University,* ***Russia***)
Angular Motion Control of a Low-Orbit Nanosatellite Using Aerodynamic Surfaces

105. **E.V. Barinova, I.V. Belokonov, I.A. Timbai** (*Samara University,* ***Russia***)
Predicting the Decrease in Altitude of a Cubesat Nanosatellite Considering its Motion Relative to the Mass Center

106. **G.M. Dovgobrod, D.S. Bakhtin, K.A. Dvornikov** (*CSRI Kurs, Moscow,* ***Russia***)
Hybrid Ship Motion Control Algorithm, Eliminating Saturation of the Control Loop

107. **I.V. Belokonov, M.S. Shcherbakov, S.A. Medvedev** (*Samara University,* ***Russia***)
Selection of Conditions for Ensuring Long-Term Passive Inspection in the Close Vicinity of a Spacecraft Motion in a Highly Elliptical Orbit

108. **V.V. Lyubimov, I. Bakry** (*Samara University,* ***Russia***)
Synthesis of Two-Channel Control to Stabilize the Rotation of a Small Asymmetric Spacecraft in the Martian Atmosphere

109. **A.A. Galyaev, A.S. Samokhin, M.A. Samokhina** *(V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow,* ***Russia***)
A Study of the Functional of Evasive Moving Object in Discrete Formulation

110. **A.S. Samokhin, M.A. Samokhina** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow,* ***Russia***)
On Constructing the Trajectory of the Spacecraft Flight to Phobos with a Perturbation Maneuver near the Moon Based on the Solution of a Combination of Four Lambert Problems

111. **I.D. Kostin, A.M. Popov, Ju.V. Fadeeva** (*D.F. Ustinov Baltic State Technical University Voenmeh, St. Petersburg,* ***Russia***)
The Algorithm of Integral Control of The Group of Small Satellites

112. **D.G. Kostrygin, A.M. Popov, A.A. Shevchik** (*D.F. Ustinov Baltic State University Voenmeh, St. Petersburg,* ***Russia***)
Algorithm for Adaptive Flight Control of Variable-Mass UAV

18.30 **DRINK RECEPTION**

WEDNESDAY, 31 MAY

SESSION IV – RELEVANT ISSUES OF THEORY

Chairmen: **Dr. Yu.A. Litmanovich,** ***Russia***
A.V. Motorin, Ph.D., ***Russia***

PLENARY PAPER

10.00 – 10.20 113. **S.E. Perelyaev, V.F. Zhuravlev** (*Ishlinsky Institute for Problems in Mechanics RAS, Moscow,* ***Russia***)
The Van der Pol Spatial Oscillator. Technical Applications in Modern Gyroscopy

POSTER PAPERS[1]

10.20 – 11.30 114. **V.M. Kotlov** (*State Research Institute of Aviation Systems, Moscow,* ***Russia***), **S.E. Perelyaev** (*Ishlinsky Institute for Problems in Mechanics RAS, Moscow,* ***Russia***)
Derivation of the Equations of Motion Dynamics of Ring Wave Solid-State and Pendulum Gyroscopes by the Method of Holonomic Mechanics

115. **M.A. Basarab** (*Bauman Moscow State Technical University, NUK IU, Moscow,* ***Russia***), **A. Giani, P. Combette** (*University of Montpellier, Institut d'Electronique et des Systèmes (IES), Montpellier,* ***France***), **B.S. Lunin** (*Lomonosov Moscow State University,* ***Russia***)
Thermal Accelerometer Analytical Simulation and Design Based on the Generalized Spherical Model

[1] *The authors of poster papers* ***at the plenary session*** *are given 3 min* ***to present the main idea of the paper*** *with 1-2 slides, if any; 2 min are given for Q&A (1-2 questions). In case of in-person participation the further discussion will continue at the posters.*

116. **K.V. Dunaevskaya, V.B. Kostousov** (*N.N. Krasovskii Institute of Mathematics and Mechanics of the Ural Branch of RAS, Yekaterinburg,* ***Russia***)
Method for Calculating the Current Accuracy Characteristic of the Search Correlation-Extremal Algorithm

117. **A.V. Molodenkov, Ya.G. Sapunkov** (*Institute for Precision Mechanics and Control Problems of RAS, Saratov,* ***Russia***), **T.V. Molodenkova** (*Yuri Gagarin State Technical University of Saratov,* ***Russia***)
Analytical Quasi-Optimal Algorithm for Program Control of an Attitude of an Axisymmetric Spacecraft

118. **I.A. Pankratov** (*Saratov State University,* ***Russia***), **Yu.N. Chelnokov** (*Institute for Precision Mechanics and Control Problems of RAS, Saratov,* ***Russia***)
Biquaternion Solution of the Problem of Optimal Minimum Time Control of the Spacecraft Spatial Motion

119. **Yu.N. Chelnokov, A.V. Molodenkov, M.Yu. Loginov** (*Institute for Precision Mechanics and Control Problems of RAS, Saratov,* ***Russia***)
Biquaternion Quasi-Optimal Analytical Solution for the Problem of Programmed Control of Spacecraft Spatial Motion

120. **V.M. Nikiforov, A.A. Gusev, K.A. Andreev, D.V. Grunenkov, E.S. Sumnitelnyi, A.S. Shiryaev, E.S. Akkuratova** (*Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making, Moscow,* ***Russia***)
Approximate Solutions of Dynamic Problems for Devices of Automatic Control Systems Using Matrix Description and Matrix Operators

121. **D.O. Prokhorova, V.I. Shiryaev** (*South Ural State University, Chelyabinsk,* ***Russia***)
Combined Use of Kalman Filter and Minimax Filter

122. **A.S. Lysenko, V.I. Kulakova, D.V. Pershin** (*Special Technology Center, St. Petersburg,* ***Russia***)
Attitude Determination and Control Algorithms to Support Optical Payload of an Earth Observation Nanosatellite

123. **I.V. Papkova, T.V. Yakovleva, A.V. Krysko, V.A. Krysko** (*Yuri Gagarin State Technical University of Saratov,* ***Russia***)
A New Shear Mathematical Model of the Vibration of Porous Functionally Graded Lamellar Accelerometers with Attached Mass in a Temperature Field

124. **M.A. Barulina, D.V. Kondratov, R. Romanov, E.V. Pankratova, S.A. Galkina** (*Institute for Precision Mechanics and Control Problems of RAS, Saratov State University, Saratov,* ***Russia***)
Conditions for the Chaotic Oscillations of Size-Dependent Planar Components of MEMS/NEMS Sensors

11.30 – 12.00 COFFEE BREAK

PANEL DISCUSSION
The Outlook for Gyroscopy

Chair: **V.G. Peshekhonov, Academician of RAS, *Russia***

12.00 – 12.20 125. **A.A. Untilov, E.V. Dranitsyna, D.A. Egorov**
(*Concern CSRI Elektropribor, JSC*, *St. Petersburg, **Russia***)
Current State and Development Prospects of Fiber-Optic Gyroscopes

12.20 – 12.40 126. **A.V. Molchanov** (*Moscow Institute of Electromechanics and Automatics, **Russia***)
Laser Gyroscope Technology in Airborne SINS. State of the Art and Future Prospects

12.40 – 13.00 127. **S.E. Perelyaev** (*Ishlinsky Institute for Problems in Mechanics RAS, Moscow, **Russia***)
Current Status of Wave Solid-State Gyroscopes. Development Prospects in Applied Gyroscopy

13.00 – 14.00 LUNCH

14.00 – 14.20 128. **G.V. Bezmen** (*Concern CSRI Elektropribor, JSC*, *St. Petersburg, **Russia***)
Current State and Future Development of Nuclear Magnetic Resonance Gyroscopes

14.20 – 14.40 129. **S.P. Timoshenkov** (*Nano and Microsystem Technology Institute, National Research University of Electronic Technology MIET, Moscow, **Russia***)
Development and Use of MEMS Components in Integrated Navigation Systems

14.40 – 15.10 **DISCUSSION**

15.10 – 15.20 **CLOSING CEREMONY**

ДЛЯ ЗАМЕТОК