PROGRAM

MONDAY, 31 MAY

8.00 – 9.50 **REGISTRATION OF THE CONFERENCE PARTICIPANTS**

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

SESSION I – MOTION CONTROL

Chairmen: **Corresponding Member of RAS, Prof. O.A. Stepanov, *Russia***
Dr. I.V. Belokonov, *Russia*

I N V I T E D P A P E R

10.15 – 11.00 1. **M.Yu. Belyaev** (*S.P. Korolev Rocket and Space Corporation Energia, Korolev, Moscow Region, **Russia***), **G.P. Anshakov** (*Joint Stock Company Space Rocket Centre Progress, Samara, **Russia***)
From the First Manned Mission into Space to the Permanently Manned Orbital Station

11.00 – 11.30 COFFEE BREAK

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

11.30 – 11.50 2. **E.A. Sergaeva, O.L. Starinova** (*Samara National Research University, **Russia***)
Motion Control of a Spacecraft with Low-Thrust Engines for a Flight to a Near-Earth Asteroid

POSTER PAPERS[1]

11.50 – 13.00

3. **I.V. Belokonov, M.S. Shcherbakov** (*Samara National Research University, **Russia***)
Development of a Single-Axis Control Law Based on SDRE-Technology for Inspection Motion of Two Nanosatellites

4. **L.I. Sinitsyn, I.V. Belokonov** (*Samara National Research University, **Russia***)
Pulse Correction of a Trajectory of a Gyrostat-Nanosatellite with an Electrothermal Propulsion System: Probabilistic Analysis

5. **A.S. Samokhin**, **M.A. Samokhina** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, **Russia***)
Estimation of the Possible Gain From the Perturbation Maneuver Near the Moon in a Flight to Mars Simulating Based on Lambert's Problems Solution

6. **A.V. Nebylov** (*State University of Aerospace Instrumentation, St. Petersburg, **Russia***), **V.A. Nebylov** (*International Institute for Advanced Aerospace Technologies, State University of Aerospace Instrumentation, St. Petersburg, **Russia***)
Modern Problems of WIG-Craft Navigation and Flight Control

7. **Xiao Yang Hu** (*Shenyang Ligong University, Shenyang, **China***), **V.V. Perliouk, A.V. Nebylov** (*International Institute for Advanced Aerospace Technologies, State University of Aerospace Instrumentation, St. Petersburg, **Russia***)
Development of an Integrated System of Onboard Equipment to Provide Trajectory Control of a Small Unmanned Aerial Vehicle

8. **E.V. Barinova, I.V. Belokonov, I.A. Timbai** (*Samara National Research University, **Russia***)
Study of Resonant Modes of Motion of a CubeSat Nanosatellite with Small Inertia-Mass Asymmetry Under the Aerodynamic Moment

[1] *The authors of poster papers at the plenary session are given 3 min to present the main idea of the paper, after that they answer 1-2 questions, if any. Participants at the conference hall may continue further discussion at the posters.*

9. **D.G. Kostrygin, A.M. Popov** (*Baltic State Technical University "Voenmeh" D.F. Ustinov, St. Petersburg, **Russia***)
Algorithms for UAV Flight Control along a Given Path Based on Guiding Vector Fields

10. **Ye.I. Somov, S.A. Butyrin, S.E. Somov** (*Samara State Technical University, Samara Federal Research Scientific Center, Russian Academy of Sciences, **Russia***)
Guidance and Control of a Space Robot at Additional Launching and Approaching an Information Geostationary Satellite

11. **A.A. Prut'ko** (*S.P. Korolev Rocket and Space Corporation Energia, Korolev, Moscow Region, **Russia)***
Search for Optimal Propellant Cyclograms of Jet Engines Firing for Large-Sized Spacecraft Reorienations

The paper is recommended by the Program Committee of the 23th Conference of Young Scientists Navigation and Motion Control

13.00 – 14.00 LUNCH

SESSION II – INTEGRATED SYSTEMS

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

PLENARY PAPERS

14.00 – 14.20 12. **V.S. Vyazmin, A.A. Golovan, Yu.V. Bolotin** (*Lomonosov Moscow State University, **Russia***)
New Strapdown Airborne Gravimetry Algorithms: Testing with Real Flight Data

14.20 – 14.40 13. **C. Doer, G.F. Trommer** (*Institute of Systems Control, Karlsruhe Institute of Technology, **Germany***)
Yaw Aided Radar Inertial Odometry Using Manhattan World Assumptions

POSTER PAPERS

14.40 – 15.30 14. **V.A. Smirnov, A.V. Prohortsov, O.V. Minina** (*Tula State University, **Russia***)
Algorithms for Fast Computation of Navigation Parameters of Mobile Objects by the GNSS Signals

15. **A.V. Prokhortsov, N.D. Yudakova** (*Tula State University, **Russia***)
Integrated Navigation System with Spaced Accelerometers

16. **Yu.V. Bolotin, A.V. Bragin** (*Lomonosov Moscow State University, **Russia***)
Comparing the Accuracy of Algorithms for Pedestrian Navigation Based on Different Methods of Correction

17. **Xu Qimin, Chang Bin, Li Xu, Liu Xixiang** (*School of Instrument Science and Engineering, Southeast University, Nanjing, **China***), **Tian Yuan** *(China Academy of Transportation Sciences, Beijing, **China**)*
Vision–IMU Integrated Vehicle Pose Estimation based on Hybrid Multi-Feature Deep Neural Network and Federated Filter

18. **V.N. Kovregin, G.M. Kovregina** (*State University of Aerospace Instrumentation, St. Petersburg, **Russia**)*
Adaptive-Robust Methods for Detecting, Capturing and Tracking Hovering, Low-and High-Speed Objects in Integrated Radar-Inertial Systems with Quasi-Continuous Radiation

19. **A.V. Savkin, D.A. Antonov, L.A. Kolganov, E.L. Chekhov** (*Moscow Aviation Institute, **Russia***)
Method for Autonomous Navigation Based on Integrated Inertial and Opto-Electronic Measurements

20. **Jiangtao Zheng, Sihai Li, Qiangwen Fu** (*School of Automation, Northwestern Polytechnical University (NPU), Xi'an, **China***)
A Loose Integrated Positioning Method of Longwall Shearer Assisted by INS and Laser Scanner

21. **A.S. Nosov** (*ITMO University, St. Petersburg, **Russia***)
Algorithm for Planning an Informative Route for Map-Aided Navigation

22. **E.G. Kharin, I.A. Kopylov,V.A. Kopelovich, L.M. Bardina, A.Yu. Zhabin, A.Yu. Makarova, A.F. Yakushev** (*Gromov Flight Research Institute, Moscow Region, Zhukovsky, **Russia***), **E.A. Falkov** (*SC «Kotlin-Novator», St. Petersburg, **Russia**)*
Developing and Assessing the Airborne Integrated Data Processing Characteristics from Inertial and Radio-Technical Systems in Flight and Navigation System

23. **Sheng Su, Zhihong Deng, Yi Yang** (*Beijing Institute of Technology, **China***)
Object Tracking and Pose Estimating Based on Camera and Lidar Fusion in Self-Driving Scenario

15.30 – 16.00 COFFEE BREAK

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

16.00 – 16.20 24. **A.G. Mikov, R.V. Voronov**, **A.P. Moschevikin** (*Petrozavodsk State University, **Russia***)
Map-Aided Dead-Reckoning for Vehicles using Rao-Blackwellized Particle Filter

16.20 – 16.40 25. **Shiming Liu**, **Sihai Li** (*School of Automation, Northwestern Polytechnical University, Xi'an, **China***)
Odometer-Aided Ultra-Tight GPS/MIMU Integration for Land Vehicle Navigation in Urban Canyons

16.40 – 17.00 26. **P.A. Semenov, K.B. Amelin, G.G. Negreskul**, **A.A. Rogova** (*JSC Navigator, St. Petersburg, **Russia**),* **A.R. Bestugin**, **I.A. Kirshina** *(State University of Aerospace Instrumentation, St. Petersburg,, **Russia***)
GNSS Landing System on a Mobile Platform with MEMS Sensors

17.00 – 17.20 27. **C. Conte**, **G.de Alteriis**, **F.de Pandi, R.S.L. Moriello, G. Rufino, D. Accardo***(University of Naples Federico II, Naples, **Italy**)*
Integration of a Sunlight Polarization Camera and Latest-Generation Inertial Sensors to Support High Integrity Navigation

POSTER PAPERS

17.20 – 17.55 28. **J. Rauch, C. Doer, G.F. Trommer** (*Institute of Control Systems, Karlsruhe Institute of Technology, **Germany***)
Object Detection on Thermal Images for Unmanned Aerial Vehicles Using Domain Adaption Through Fine-Tuning

The paper is recommended by the Program Committee of the 23th Conference of Young Scientists Navigation and Motion Control

29. **V.M. Achildiev** (*"SPU Geofizika-NV" Stock Company, The Mytishchi branch of the Bauman MST, Moscow, **Russia***), **M.A. Basarab, N.S. Konnova** (*Bauman Moscow State Technical University, **Russia***), **Yu.N. Evseeva, N.A. Bedro** (*"SPU Geofizika-NV" Stock Company, Moscow, **Russia***), **Yu.K. Gruzevich** *("SPU Geofizika-NV" Stock Company, Bauman Moscow State Technical University, **Russia***), **V.M. Uspenskiy** (*Branch of the Military Medical Academy named after S.M. Kirov, Moscow, **Russia***)
Human Internal Organs Diagnostics Based On Heart Biophysical Signals

30. **A.V. Nemov** (*Russian Institute of Radionavigation and Time, St. Petersburg, **Russia***), **D.Yu. Tyuftyakov** (*JSC "KB NAVIS", St. Petersburg, **Russia***)
On the Estimation of Subspaces Dimensionality in the Correlation Analysis of Signals Received and Processed by a GNSS Digital Antenna Array

31. **A.V. Telny** (*Vladimir State University, **Russia***)
On the Estimation of the Measurement Accuracy of Satellite Navigation Systems Using Dynamic Recursive Correction

32. **A.A. Kumarin, S.V. Shafran, I.A. Kudryavtsev, V.M. Grechishnikov** (*Samara University, **Russia***)
A GNSS Signal Tracking Algorithm with Data Reduction

TUESDAY, 1 JUNE

SESSION II – INTEGRATED SYSTEMS
(continued)

Chairmen: **Mr. K.K. Veremeenko, Ph.D., *Russia***
Mr. A.V. Motorin, Ph.D., *Russia*

I N V I T E D P A P E R

9.00 – 9.45 33. **K. Schilling** *(Center for Telematics, Würzburg, **Germany**)*
Small Satellite Formations: Challenges in Navigation and its Application Potential

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

9.45 – 10.05 34. **V.B. Pudlovskiy** (*Federal State Unitary Enterprise «Russian Metrological Institute of Technical Physics and Radio Engineering», Mendeleevo, Moscow Region, **Russia***)
Comparison of GNSS Solution Errors Using an Atomic Clock or Crystal Oscillator

P O S T E R P A P E R S

10.05 – 10.50 35. **M.S. Selezneva, A.V. Proletarsky, K.A. Neusypin**
(*Bauman Moscow State Technical University, **Russia***)
Correction of the Navigation System of a Re-entry Spacecraft after External Sensors are Disabled

36. **A.V. Sholokhov**, **S.B. Berkovich, N.I. Kotov**
(*Institute of Engineering Physics, Serpukhov, Moscow Region, **Russia***)
Simulation of Self-Consistent Transformants for the Anomalous Gravity Field at Local Regions

37. **M.S. Selezneva, K.A. Neusypin, Pham Xuan Truong**
(*Bauman Moscow State Technical University, **Russia***)
Method for Integrating Measuring Systems of an Unmanned Aerial Vehicle

38. **Shaobo Wang, Yingjun Zhang** (*Institute of Traffic Information Engineering, Dalian Maritime University, **China***)
An Integrated Navigation Decision-Making System Considering the Real Sea Scenario

39. **I.O. Lawal** (*Advanced Aerospace Engines Laboratory, National Space Research and Development Agency, Oka Akoko, Ondo State, **Nigeria***), **S.O. Sholiyi** (*Centre for Space Transport and Propulsion, National Space Research and Development Agency, Epe, Lagos, **Nigeria***), **A.V. Nebylov** (*International Institute for Advanced Aerospace Technologies, State University of Aerospace Instrumentation, St. Petersburg, **Russia***)
Development of Intelligent Control Architecture for Multi-Tracking Surveillance Systems

40. **S.P. Simakov, I.V. Belokonov** (*Samara National Research University, **Russia***)
Algorithm of Determining the Spatial Orientation of Noncooperative Space Object Based on Processing of a Sequence of Stereo Images

10.50 – 11.20 COFFEE BREAK

PLENARY PAPERS

11.20 – 11.40 41. **A.B. Tarasenko, A.A. Fomichev, P.V. Larionov** (*Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, **Russia***), **A.B. Kolchev** (*JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***), **P.A. Filatov, E.A. Milikov** (*Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, **Russia***)
Development, Tuning and Testing of a New Small-Sized Integrated Navigation System

11.40 – 12.00 42. **Y. Z. Lu** (*Naval Research Academy, Beijing, **China***), **X. L. Wang, W. Y. Zhao, Y. M. Wang, X. M. Zhao** (*Tianjin Navigation Instrument Research Institute, **China***)
Research on Axis Misalignment Auto-Calibration of Rotary INS/CNS Integrated System

12.00 – 12.20	43.	**B.S. Aleshin, A.I. Chernomorsky, E.D. Kuris, K.S. Lelkov, V.A. Petruhin, V.V. Miheev, T.S. Khorev** (*Moscow Aviation Institute, **Russia***) Ground Uniaxial Wheeled Modules for Transportation and Angular Orientation Control of Environmental Monitoring Equipment
12.20 – 12.40	44.	**B. Tennstedt, S. Schön** (*Institute of Geodesy, Leibniz University Hannover, **Germany***) Integration of Atom Interferometers and Inertial Measurement Units to Improve Navigation Performance
12.40 – 13.00	45.	**R.R. Bikmaev** (*Institute of Engineering Physics, Serpukhov, Moscow Region, **Russia***) Error Estimation of a Strapdown Inertial Navigation System Based on the Results of Road Sign Recognition in a Multidimensional Optical Geophysical Field
13.00 – 14.00		LUNCH

SESSION III - INERTIAL SYSTEMS AND SENSORS

Chairmen: **Mr. C. Dedieu, *France***
Mr. N.G. Skidanov, Ph.D., *Russia*

PLENARY PAPER

14.00– 14.20 46. **A.V. Chernodarov, A.P. Patrikeev** (*NaukaSoft Experimental Laboratory, Ltd., Moscow, **Russia***), **S.E. Perelyaev** (*Ishlinsky Institute for Problems in Mechanics of RAS, Moscow, **Russia***)
Inertial Navigation and Geophysical Invariants

POSTER PAPERS

14.20 – 15.30 47. **L.N. Belsky, L.V. Vodicheva, Yu.V. Parysheva** (*JSC Academician N.A. Semikhatov Scientific and Production Association of Automatics, Ekaterinburg, **Russia***)
Estimation of Generic Parameters in a Technique for Initial Alignment and Calibration of INS for Space Launch Vehicles

48. **V.A. Smirnov, A.V. Prohortsov, A.E. Soloviev** (*Tula State University, **Russia***)
A Method for Calibration of Medium-Accuracy Strapdown INS

49. **Lisan Ozan Yaman** (*Roketsan Missile Industries Inc., Ankara, **Turkey***)
The Performance Evaluation of Gravity and Zero Velocity Measurement Based Field Calibration Methods Applicable for Various Grades of Inertial Sensors

50. **G.O. Barantsev, A.A. Golovan, A.I. Matasov** (*Lomonosov Moscow State University ,**Russia***), **P.V. Alyunov, A.Yu. Mishin, D.M. Fomin** (*JSC ASPE «TEMP-AVIA», Arzamas, **Russia***)
Test Bench Calibration of an Accelerometer Unit with Scale Factor Errors Depending on Input Signal Signs

51. **S.Yu. Perepelkina, A.A. Fedotov** (*Scientific and Production Association of Automatics named after academician N.A. Semikhatov, JSC, Ekaterinburg,* ***Russia***)
Determining Permissible Levels of Frequency Characteristics of Measuring Channels in a Strapdown Inertial Navigation System

52. **V.V. Avrutov, O.I. Nesterenko** *(Kiev Polytechnic Institute,* ***Ukraine***)
A Method for Autonomous Determination of a Vehicle's Latitude and Longitude

53. **A.V. Chernodarov, P.S. Gorshkov, A.P. Patrikeev** (*NaukaSoft Experimental Laboratory, Ltd., Moscow,* ***Russia***)
Adaptive Robust Processing of Inertial Sensor Signals

54. **Ye Tian, Nan Li, Gongmin Yan, Zhongshuai Yu** (*School of Automation, Northwestern Polytechnical University, Xi'an,* ***China***)
Initial Alignment of Swing Base Based on Parameter Identification Method without Latitude

55. **D.A. Burov** (*VNII Signal JSC, Kovrov,* ***Russia***)
The Results of Estimating the Accuracy of Azimuth Determination by Ring Laser Gyroscopes

56. **A.V. Bolshakova, A.M. Boronakhin, E.D. Bokhman, D.Yu. Larionov, L.N. Podgornaya, A.N. Tkachenko, R.V. Shalymov** (*Saint Petersburg Electrotechnical University «LETI»,* ***Russia***)
Specific Features of Using Micromechanical Accelerometers for Monitoring Short and Impact Irregularities of the Railway Track

57. **Kun Wei**, **Xu Li, Xixiang Liu, Peizhou Ni** (*School of Instrument Science and Engineering Southeast University, Nanjing,* ***China***), **Xiaonan Li** *(China Transport Telecommunications & Information Center, Beijing,* ***China)***
A Reliable Fault-Tolerant Estimation Method of Roll State for Tank Semi-trailer Based on Inertial Measurement

58. **N. Abdelrahman**, **A. Annenkova**, **D. Pritykin** (*Skolkovo Institute of Science and Technology, Moscow,* ***Russia***), **D. Ivanov** (*Keldysh Institute of Applied Mathematics, Moscow,* ***Russia***)
Enhancing CubeSat Active Magnetic Attitude Control Based on the Results of the Ground Tests

59. **A.V. Prohortsov, V.A. Smirnov** (*Tula State University,* ***Russia***), **M.A. Prohortsova** (*Schoolchild, Education Center No.39, Tula,* ***Russia***)
Human Respiration Measurement System

15.30 – 16.00 COFFEE BREAK

PLENARY PAPER

16.00– 16.20 60. **Xu-dong Hu**, **Wei Hong**, **Pei Zhang, Hong-gang Chen, Wei Jiang, Bo Huang, Shao-feng Lou, Jian-qing Wang** (*Institute of Systems Optimization, Xi'an Aerospace Precision Electromechanical Institute,* ***China***), **Han-rui Yang** (*School of Automation Engineering Northeast Electric Power University, Jilin,* ***China)***
Reduction of the Shupe Effect in Fiber Coil Based on Turn Number Optimization

POSTER PAPERS

16.20 – 16.55 61. **Duanyang Gao, Baiqing Hu, Lubin Chang, Fangjun Qin, Xu Lyu** (*Department of Navigation Naval University of Engineering, Wuhan,* ***China***)
A Real Time Gravity Compensation Method for High Precision INS Based on Neural Network

62. **A.V. Motorin, O.A. Stepanov, A.A. Krasnov, A.V. Sokolov** (*Concern CSRI Elektropribor, JSC, ITMO University, St. Petersburg,,* ***Russia***)
Identification of the Model Parameters for the Damped Gravimeter Sensitive Element

63. **D.M. Kalikhman, E.A. Deputatova, D.S. Gnusarev** (*Branch of FSUE "Academician Pilyugin Center" - Production Association "Korpus", Saratov,* ***Russia***)
Estimation of Errors in Modern Information and Measurement Systems under Real Operating Conditions Using the Frequency Method

64. **Da Li, Wei Wang, Hongguang Liu** (*Tianjin Navigation Instrument Research Institute,* ***China***), **Li Li** (*Harbin Labor Technician College*, ***China***), **Hongwei Gao** (*Laboratory of Science and Technology on Marine Navigation and Control of China State Shipbuilding Corporation, Tianjin,* ***China***)
Self-Gradient Calculation Method of Gravity Gradiometer Platform Based on Finite Element

65. **A.G. Kuznetsov, V.I. Galkin, D.N. Vorob'ev** (*PJSC Moscow Institute of Electromechanics and Automatics*), ***Russia***)
Methods to Improve the Accuracy Characteristics of Gyroscopic Devices Based on Micromechanical Sensors for Flight Control Systems

66. **A.V. Lukin** (*Peter the Great St. Petersburg Polytechnic University,* ***Russia***)
Method for Determining Stability Regions of Stationary Vibrations of a Nonlinear MEMS Resonator under Action of PLL-AGC Self-Oscillation Loop

The paper is recommended by the Program Committee of the 23th Conference of Young Scientists Navigation and Motion Control

67. **Ye.I. Somov, S.A. Butyrin, S.E. Somov** (*Samara State Technical University,* ***Russia***)
Inertial Navigation and Control of a Space Robot for Servicing a Geostationary Satellite

WEDNESDAY, 2 JUNE

SESSION III - INERTIAL SYSTEMS AND SENSORS
(continued)

Chairmen: **Prof. Yuanxin Wu, *China***
Yu.A. Litvinenko, PhD, Russia

PLENARY PAPERS

9.00 – 9.20 68. **Yu.Yu. Broslavets** (*Moscow Institute of Physics and Technology, JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***), **D.M. Ambartsumyan** (*Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, **Russia***), **V.G. Semenov, A.A. Fomichev, E.A. Polukeev** (*Moscow Institute of Physics and Technology, JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***)
Multifrequency Solid-State Ring Laser Gyroscope Based on YAG:Cr4+

9.20 – 9.40 69. **Yu.Yu. Broslavets** (*Moscow Institute of Physics and Technology, JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***), **A.I. Varenik** (*Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, **Russia***), **A.B. Kolchev** (*JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***), **P.V. Larionov, E.A. Milikov, A.D. Morozov** (*Moscow Institute of Physics and Technology, JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***), **E.A. Polukeev, V.G. Semenov, A.B. Tarasenko, P.A. Filatov** (*Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, **Russia***), **A.A. Fomichev** (*Moscow Institute of Physics and Technology, JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***)
New Four-Frequency Zeeman Laser Gyroscope with a Nonplanar Symmetric Cavity, Its Parameters and Operation

POSTER PAPERS

9.40 – 11.00 70. **D.S. Smirnov, I.G. Deyneka, A.V. Kulikov, V.E. Strigalev, I.K. Meshkovskiy** (*ITMO University, St. Petersburg, **Russia***)
Methods for Studying Temperature Characteristics of a FOG Sensing Element

71. **D.R. Devet'yarov** (*Concern CSRI Elektropribor, JSC, St. Petersburg, **Russia***)
Polarization-Maintaining Germanosilicate Waveguide with Elliptical Core for Fiber-Optic Gyroscopes

The paper is recommended by the Program Committee of the 23th Conference of Young Scientists Navigation and Motion Control

72. **E.A. Petrukhin** (*JSC «Serpukhov Plant «Metallist», **Russia***), **A.S. Bessonov** (*MIREA - Russian Technological University, Moscow, **Russia***)
Dissipative and Conservative Backscattering in a Laser Gyro Ring Cavity

73. **G.O. Barantsev, A.V. Kozlov** (*Lomonosov Moscow State University, **Russia***), **I.Kh. Shaimardanov** (*JSC "Inertial Technologies of Technocomplex", Ramenskoye, **Russia***)
Elastic Dynamic Deformation of an RLG Mechanical Dither and its Effect on the Attitude Determination Accuracy

74. **A.A. Aviev** (*NPK «Electrooptika» corp., Moscow, **Russia***)
Simulation of the Dither Parameters Measuring Provided by the Optoelectronic System for a Laser Gyro under the Influence of Real Disturbances

The paper is recommended by the Program Committee of the 23th Conference of Young Scientists Navigation and Motion Control

75. **P.A. Filatov**(*Moscow Institute of Physics and Technology, **Russia***), **E.A. Milikov** (*Moscow Institute of Physics and Technology, JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***), **A.I. Varenik, A.D. Morozov** (*JSC «LASEX», Dolgoprudniy, Moscow Region, **Russia***), **V.G. Semenov, A.B. Tarasenko** (*Moscow Institute of Physics and Technology, **Russia***), **A.A. Fomichev** (*Moscow Institute of Physics and Technology, JSC «LASEX», Dolgoprudny, Moscow Region, **Russia***)
Studying the Accuracy Characteristics of Q-flex Accelerometers for Modernization of SINS

76. **Yao Pan, Yunfeng Tao, Libin Zeng, Xingyuan Tang, Kaiyong Yang, Hui Luo** (*National University of Defense Technology, Changsha, **China***)
Investigation on the Optimal Fixation Condition of Cylindrical Resonators

77. **V.Ya. Raspopov, R.V. Alaluev, V.V. Likhosherst** (*Tula State University, **Russia***), **S.I. Shepilov** (*JSC Michurinsky Progress plant, **Russia***)
Gyrostabilizer with an Increased Controlled Precession Rate Based on a Gyroscope with a Spherical Ball Bearing Suspension

78. **P.K. Plotnikov** (*Yury Gagarin State Technical University of Saratov, **Russia***)
Study of the Effect of Introducing a Computer Model of Translational Motions and Negative Feedback Loops to the Three-Component Gyroscopic Angular Rate Meter Based on Kovalevskaya Gyroscope

79. **A.N. Korolev, E.D. Bokhman, P.A. Pavlov, P.A. Ivanov, Yu.V. Filatov** (*Saint Petersburg State Electrotechnical University «LETI», **Russia**),* **A.Ya. Lukin** *(Peter the Great St. Petersburg Polytechnic University, **Russia***)
Development of Digital Angle Measuring Technologies Based on the Use of Two-Dimensional Scales for Metrological Support of Navigation Systems

80. **M.X. Xing** (*Beijing Institute of Aerospace Control Devices, **China***), **G. Toker** (*AMSYS Ltd, Tel Aviv Yafo, **Israel***), **V. Sobolev** (*VIZOR Ltd, Tel Aviv Yafo, **Israel***)
Improvement of the Accuracy of Angular Encoders

81. **V.M. Nikiforov, A.S. Anokhin, A.D. Vorona, B.D. Chernyshev, A.A. Gusev, K.A. Andreev,** (*Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making, Moscow, **Russia***), **A.A. Nizhegorodov** *(Peter the Great Military Academy of Strategic Rocket Forces, Serpukhov, Moscow Region, **Russia**)*
Computer-Aided Synthesis of a Pendulum Accelerometer Correction Circuit

82. **I.N. Khokhlov, A.O. Sinelnikov***(POLYUS Research Institute of M.F.Stelmakh Joint Stock Company, Moscow,* ***Russia****)*
A Method for Measuring the Lock-in Zone in Laser Gyro Sensors

83. **A.A. Maslov, D.A. Maslov, I.V. Merkuryev, V.V. Podalkov** (*National Research University «Moscow Power Engineering Institute»,* ***Russia***)
The Impact of Nonlinearity and Frequency Difference on the Drift of the Solid-State Wave Gyroscope in the Angular Velocity Sensor Mode

84. **M.A. Basarab, I.P. Ivanov***(Bauman Moscow State Technical University,* ***Russia****),* **B.S. Lunin** *(Lomonosov Moscow State University,* ***Russia****)*
Parameter Estimation of the Solid-State Wave Gyroscope on the Basis of the Neural Network Autoregression Algorithm for Time Series Prognosis

11.00 – 11.30 COFFEE BREAK

SESSION IV – RELEVANT ISSUES OF THEORY

Chairmen: **Prof. A.A. Golovan, *Russia***
Dr. Yu.A. Litmanovich, *Russia*

PLENARY PAPER

11.30 – 11.50 85. **Wei Ouyang, Yuanxin Wu** (*Shanghai Jiao Tong University, **China***)
Inertial Navigation by the Trident Quaternion

POSTER PAPERS

11.50 – 13.00 86. **Yu.N. Chelnokov, M.Yu. Loginov** (*Institute of Precision Mechanics and Control of RAS, Saratov, **Russia***)
New Quaternion Models of Spaceflight Regular Mechanics and their Applications in the Problems of Motion Prediction for Cosmic Bodies and in Inertial Navigation in Space

87. **A.V. Molodenkov, Yu.N. Chelnokov** (*Institute of Precision Mechanics and Control of RAS, Saratov, **Russia***), **S.E. Perelyaev** (*Ishlinsky Institute for Problems in Mechanics of RAS, Moscow, **Russia***)
Quaternion Algorithm for Mathematical Initial Alignment of Strapdown INS on a Fixed Base Using Tikhonov Regularization

88. **P.K. Plotnikov, A.P. Plotnikov**(*Yuri Gagarin State Technical University of Saratov, **Russia***)
Analysis of Motion Equations and Some Properties of the Corrected Strapdown Computer-Aided Gyrocompass

89. **S.E. Perelyaev, V.Ph. Zhuravlev** (*Ishlinsky Institute for Problems in Mechanics of RAS, Moscow, **Russia***), **B.P. Bodunov, S.B. Bodunov** *(JSC RPE «MEDICON», Miass, Chelyabinsk Region, **Russia**)*
Theory of the Van der Pol Two-Degree-of-Freedom Oscillator: Technical Applications to Modern Solid-State Wave Gyros

90. **D.A. Koshaev** (*Concern CSRI Elektropribor, JSC, ITMO University, St. Petersburg, **Russia***)
Generation of Smoothing Spline for On-Line Estimation of a Maneuvering Vehicle Trajectory

91. **D.A. Bedin, A.G. Ivanov** (*N.N. Krasovskii Institute of Mathematics and Mechanics (IMM UB RAS), Ekaterinburg, **Russia***)
Multicriteria Optimization of the Trajectory Tracking Filtering Procedure by Genetic Algorithm

92. **A.A. Galyaev, A.S. Samokhin, M.A. Samokhina** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, **Russia)***
Application of the Gradient Projection Method to the Problem of Sensors Arrangement for Counteraction to the Evasive Object

93. **O.S. Amosov, S.G. Amosova** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, **Russia***)
Adaptive Estimation of the Processes-Having Disorders in Navigation Applications Using Machine Learning

94. **M.A. Barulina, D.V. Kondratov, S.A. Galkina, O.V. Markelova** (*Institute of Precision Mechanics and Control of RAS, Saratov, **Russia***)
Nanoscale Inertial-Sensor Elements. Numerical and Analytical Modeling of Motion

95. **I.V. Papkova**, **A.V. Krysko**, **V.A. Krysko** (*Yuri Gagarin State Technical University of Saratov, **Russia***)
General Theory of NEMS Resonators in the Form of Nanobeams and Nanoplates

13.00 – 14.00 LUNCH

PANEL DISCUSSION: Motion Control of Moving Objects

Chairmen: **Corresponding Member of RAS, Prof. O.A. Stepanov, *Russia***
Dr. L.B. Rapoport, *Russia*

14.00 – 15.30 **Reports:**

96. **M.Yu. Ovchinnikov** (*Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences, Moscow, **Russia***)
Motion Control and Navigation Problems in Interplanetary Missions Based on Small Spacecraft

97. **Mengyin Fu** (*Nanjing University of Science and Technology, **China***)
Autonomous Navigation, Planning and Control of Unmanned Ground Vehicles in Complex and Dynamic Environments

98. **D.A. Kozorez, M.N. Krasilshchikov, D.M. Kruzhkov** (*Moscow Aviation Institute, **Russia***)
Resolving the Navigation and Control Problems of Payload Insertion into a Geostationary Orbit on the Basis of the Modern and Potential GNSS Technologies

99. **L.B. Rapoport, A.A. Generalov** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, **Russia***), **T.A. Tormagov, M.Yu. Shavin** (*Skolkovo Institute of Science and Technology, Moscow, **Russia***)
Navigation and Control Problems in Precision Farming

100. **A.V. Nebylov** (*State University of Aerospace Instrumentation, St. Petersburg, **Russia)***
The Problem of Studying the Maximum Error in Solving the Motion Control Problems

DISCUSSION

15.30 – 15.40 **CLOSING CEREMONY**