

# PROGRAM

**MONDAY, 26 MAY**

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

10.00 – 10.15    **OPENING CEREMONY**

**SESSION I – INTEGRATED SYSTEMS**

Chairmen – **Dr. B.S. Rivkin**, Russia  
**Mr. L. Camberlein**, France

**PLENARY PAPER**

- 10.15 – 10.35      1. **R.N. Akhmetov, G.P. Anshakov, S.K. Grigoryev, V.A. Tipukhov, A.V. Filatov, D.A. Ivakin, M.G. Shipov** (*TsSKB-Progress SRP SRC FSUE, Samara, Russia*)  
Resurs-P Spacecraft Motion Control System:  
Scientific and Technical Problems and their Solutions

**POSTER PAPERS <sup>1</sup>**

- 10.35 – 10.50      2. **Ye.I. Somov, S.A. Butyrin** (*Samara State Technical University, Samara, Russia*), **C.M. Hacizade** (*Istanbul Technical University, Istanbul, Turkey*)  
In-Flight Calibration of a SINS for a Small Information Satellite with Correction from the Sun and Magnetic Sensors
3. **Ye.I. Somov, S.A. Butyrin** (*Samara State Technical University, Samara, Russia*), **V.P. Makarov** (*SRP Rocket-Space Centre TsSKB-Progress, Samara, Russia*), **S.Ye. Somov** (*Samara State Technical University, Samara, Russia*)  
Ensuring the Survivability of the Attitude Control System for a Land-Survey Mini-Satellite in Critical Situations

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4. **J. Bačík, P. Fedor, D. Perduková** (*Technical University of Košice, Košice, Slovakia*)  
A Modular Sensorial System for Testing of T-Rex 600 Helicopter Navigation and Flight Control Algorithms
5. **G.E.Yatsuk, A.B.Umanskii, A.V.Esinovskii** (*Scientific Production Association (SPA) of Automatics, Yekaterinburg, Russia*)  
Onboard Digital Computing Systems for Operation in Extreme Conditions as Part of the Control Systems of Small-Size Aircraft
6. **D.A.Khanevskii, A.B.Umanskii, G.E. Yatsuk, S.A.Golovanov** (*Scientific Production Association (SPA) of Automatics, Yekaterinburg, Russia*)  
Specific Features of the Program Entry Mode for the Soyuz-2 Launch Vehicle Onboard Control System on the Basis of the Malakhit-7 Digital Computing System

10.50 – 11.00

**DISCUSSION OF THE POSTER PAPERS**

11.00 – 11.30

**COFFEE BREAK**

#### **PLENARY PAPERS**

11.30 – 11.50

7. **Yingwei Zhao, Matthias Becker, David Becker, Stefan Leinen** (*Technical University of Darmstadt, Darmstadt, Germany*)  
Improving the Performance of Tightly-Coupled GPS/INS Navigation by Using Time-Differenced GPS-Carrier-Phase Measurements and Low-Cost MEMS IMUs

11.50 – 12.10

8. **Ya.I.Binder, A.L.Gutnikov, A. E.Eliseenkov, A.S.Lysenko, T.V.Paderina, V.N.Polienko, V.G.Rozentsvein** (*Concern CSRI Elektropribor, JSC, St. Petersburg, Russia*), **D.A.Sokolov, O.E.Evgrafov, P.A.Klyushkin** (*ZAO Design Engineering Bureau of Underground Navigation, St. Petersburg, Russia*)  
A New Engineering Approach to Hole-Making Position Control on the Arctic Shelf

- 12.10 – 12.30      9. **A.I. Gatcenko, F.S.Dubrovin** (*Far Eastern Federal University, Vladivostok, **Russia***), **A.F.Scherbatyuk** (*Institute for Marine Technology Problems FEB RAS, Vladivostok, **Russia***)  
Some Results of Marine Trials for Mobile AUV Navigation with a Single Moving Beacon

## POSTER PAPERS <sup>1</sup>

- 12.30 – 12.50      10. **E.G. Kharin, V.A.Kopelovich, I.A.Kopylov** (*JSC M. M. Gromov Flight Research Institute, Zhukovsky, Moscow region, **Russia***), **A.V.Trebukhov, S.V.Larionov** (*JSC Inertial Technologies of Tehnocomplex, Ramenskoye, Moscow region, **Russia***)  
The Results of the LINS-100RS Integrated Inertial Navigation System Flight Tests
11. **G.I.Yemel'yantsev, B.A. Blazhnov, A.P.Stepanov, I.V. Semyonov** (*Concern CSRI Elektropribor, JSC, St.Petersburg, **Russia***)  
Attitude Determination for Fast-Rotating Objects by a MEMS-Based Integrated System
12. **B.A.Blazhnov** (*Concern CSRI Elektropribor, JSC, St.Petersburg, **Russia***), **D.A.Koshaev** (*Concern CSRI Elektropribor, JSC, NRU ITMO, St. Petersburg, **Russia***), **P.Yu.Petrov** (*Concern CSRI Elektropribor, JSC, St. Petersburg, **Russia***)  
Adjusting the Data of a Two-Antenna GNSS System to the IMU-Fixed Coordinate Frame

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13. **Hamza Benzerrouk** (*Saad Dahlab University of Blida, Blida, Algeria, International Institute for Advanced Aerospace Technologies of Saint Petersburg State University of Aerospace Instrumentation, Saint Petersburg, Russia*), **Hassen Salhi** (*Saad Dahlab University of Blida, Blida, Algeria*), **A.V.Nebylov** (*International Institute for Advanced Aerospace Technologies of Saint Petersburg State University of Aerospace Instrumentation, St. Petersburg, Russia*)  
Decentralized Information Fusion for an Integrated Navigation System Based on the Gauss-Hermite Kalman Filter
14. **A.V.Chernodarov, A.P.Patrikeev** (*NaukaSoft Experimental Laboratory, Ltd., Moscow, Russia*), **Yu.N.Korkishko, V.A. Fedorov** (*“OPTOLINK” RPC, Ltd, Zelenograd, Moscow, Russia*)  
An Object-Oriented Modular Technology for the Creation of Integrated Navigation Systems
15. **A.M.Boronahin, L.N.Podgornaya, E.D.Bokhman, D.Yu.Larionov, R.V.Shalymov** (*Saint Petersburg State Electrotechnical University named after V.I. Ulianov (Lenin), Saint Petersburg, Russia*)  
Integrated Inertial Technologies for Dynamic Monitoring of Railway Tracks

12.50 – 13.00

**DISCUSSION OF THE POSTER PAPERS**

13.00 – 14.00

**LUNCH**

## **PLENARY PAPERS**

14.00 – 14.20

16. **A.Barrau, E.Robert, X.Bissuel** (*Sagem, Eragny, France*)  
Invariant Filtering Methods Applied to Inertial Navigation

14.20 – 14.40

17. **E.A.Mikrin, M.V.Mikhailov, S.N.Rozhkov, A.S.Semenov, I.A.Krasnopolsky** (*S.P. Korolev Rocket and Space Corporation Energia, Korolev, Moscow region, **Russia***), **V.N.Pochukaev** (*FSUE TsNIImash, Korolev, **Russia***), **Yu.G. Markov, V.V.Perepelkin** (*Moscow Aviation Institute, Moscow, **Russia***)  
High-Accuracy Prediction of Spacecraft Orbit Evolution, Analysis of Various Perturbations in the Course of Spacecraft Motion in LEO and HEO Orbits

## POSTER PAPERS <sup>1</sup>

14.40 – 15.05

18. **A.A.Golovan, A.V.Kozlov, A.A.Nikulin** (*Lomonosov Moscow State University, Moscow, **Russia***)  
Models for Integration of a Strapdown INS and a GNSS Receiver with Several Spaced Antennas
19. **K.K.Veremeenko, I.M. Kuznetsov** (*Moscow Aviation Institute (National Research University), Moscow, **Russia***)  
Studying the Characteristics of an Airport Vehicle Navigation System in the Conditions of Essential Disturbances
20. **O.A.Stepanov** (*Concern CSRI Elektropribor, JSC, National Research University ITMO, Saint Petersburg, **Russia***), **A.V.Motorin** (*National Research University ITMO, Saint Petersburg, **Russia***)  
Identification of Sensor Errors: Allan Variance vs Nonlinear Filtering

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21. **A.A Panyov, A.A Golovan** (*Lomonosov Moscow State University, Laboratory of Navigation and Control, Moscow, **Russia***), **A.S Smirnov, V.V. Kosyanchuk** (*Lomonosov Moscow State University, Moscow, **Russia***)  
Indoor Positioning Using Wi-Fi Fingerprinting, Magnetometer and Pedestrian Dead Reckoning
22. **Yu.S.Vasilieva, V.V.Sherbinin** (*JSC TSNIAG, Moscow, **Russia***), **E.V.Shevtsova** (*Bauman Moscow State Technical University, Moscow, **Russia***)  
Development of Algorithms for a Color Vision-Based Correlation-Extremal Navigation System for Horizontally Flying Objects

15.05 – 15.20

**DISCUSSION OF THE POSTER PAPERS**

15.20 – 15.50

**COFFEE BREAK**

Chairmen – **Prof. I.M. Okon**, Russia, USA  
**Dr. A.V. Sokolov**, Russia

**PLENARY PAPERS**

- 15.50 – 16.10      23. **M.Popp, R.Granacher, G.F.Trommer** (*Institute of Systems Optimization (ITE), Karlsruhe Institute of Technology (KIT), Karlsruhe, **Germany***)  
Automatic Building Detection in Aerial Images to Support Micro Aerial Vehicle Self-Localization in Urban Environment

**POSTER PAPERS** <sup>1</sup>

- 16.10 – 16.30      24. **A.M.Aleshechkin, A.D.Kuroptev** (*Siberian Federal University, Krasnoyarsk, **Russia***)  
Unambiguous Surface Vessels Positioning by Means of the Phase Radionavigation System Signals

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25. **V.I.Baburov, N.V.Ivantsevich, O.I.Sauta** (*OJSC AUSRIRE, NTC Navigator, Saint Petersburg, **Russia***)  
Integrating Heterogeneous Navigation Data under A-Priori Uncertainty
26. **D.A.Bedin, A.G.Ivanov, A.A.Fedotov** (*Krasovskii Institute of Mathematics and Mechanics, Ural Branch, Russian Academy of Sciences, Ekaterinburg, **Russia***)  
Geometric Matching of Tracks from Several Radars and Estimation of Systematic Errors in Measurements
27. **P.P.Kravchenko, N.Sh.Khusainov** (*Southern Federal University, Taganrog, **Russia***),  
**V.V.Scherbinin** (*Central Research Institute of Automation and Hydraulics, Moscow, **Russia***)  
Methodology of the Flying Object Control Based on Second-Order Delta Transformations and Principles of the Inverted Pendulum Cart Control
28. **O.S.Amosov, S.G. Baena** (*Komsomolsk-on-Amur State Technical University, Komsomolsk-on-Amur, **Russia***)  
Optimal Nonlinear Estimation by Using Hierarchical Synthetic Systems
29. **N.A.Sedova** (*G.I. Nevelskoy Maritime State University, Vladivostok, **Russia***)  
A Logical-Linguistic Model of Ship Collision Avoidance in a Heavy-Traffic Zone

16.30 – 16.50

**DISCUSSION OF THE POSTER PAPERS**

17.00 – 21.00

**SIGHT-SEEING GUIDED BUS TOUR  
OF SAINT PETERSBURG**

**TUESDAY, 27 MAY**

**SESSION I - INTEGRATED SYSTEMS**

(Continued)

Chairmen – **Prof. I.M. Okon**, Russia, USA  
**Dr. A.V. Sokolov**, Russia

**PLENARY PAPERS**

- 9.00– 9.20            30. **K.G.Kebkal, O.G.Kebkal, E.V.Glushko** (*Evologics GmbH, Berlin, Germany*)  
Propagation Time Accuracy of Underwater Acoustic Communication Signals for AUV Navigation: Theory and Experiment
- 9.20– 9.40            31. **V.M.Antimirov, A.Yu.Vagin, A.B.Umanskii, L.N.Shalimov, G.E. Yatsuk** (*Scientific Production Association (SPA) of Automatics, Yekaterinburg, Russia*)  
A New Generation of Fail-Safe Controlling Digital Computing Systems for Aerospace Hardware
- 9.40 – 10.00        32. **C. Kabakchiev** (*Sofia University, Sofia, Bulgaria*), **V. Behar** (*IICT-BAS, Sofia, Bulgaria*), **P.Buist** (*NLR, Amsterdam, The Netherlands*), **I. Garvanov** (*University of Library Studies and Information Technologies, Sofia, Bulgaria*), **D. Kabakchieva** (*University of National and World Economy, Sofia, Bulgaria*), **N. Gaubitch** (*Delft University of Technology, Delft, The Netherlands*), **M. Bentum** (*University of Twente, Enschede, The Netherlands*)  
Study of CFAR Algorithms for Signal Acquisition in Radio Pulsar-Based Navigation



## POSTER PAPERS <sup>1</sup>

- 10.00– 10.25      33. **N.Sh.Khusainov** (*Southern Federal University, Taganrog, **Russia***)  
An Algorithm for Detecting and Isolating Difficult-to-Detect Failures of Beacons Using a Redundant Set of Instant Range Measurements in a Short-range Radionavigation System
34. **G.B.Sidelnikov** (*Concern CSRI Elektropribor, JSC, St. Petersburg, **Russia***)  
Adaptive Attitude Determination Algorithm in Signal Processing As Applied to Superresolution Problem
35. **A.I.Mashoshin, A.V.Shafranyuk** (*Concern CSRI Elektropribor, JSC, St. Petersburg, **Russia***)  
Positioning of Sonar Sensors in Distributed Undersea Surveillance Systems
36. **S.V.Sokolov** (*Rostov-on-Don State Transport University, Rostov-on-Don, **Russia***), **V.A.Pogorelov** (*Federal State Unitarian Enterprise Scientific Research Institute of Radio Communication, Rostov-on-Don, **Russia***), **E.G.Chub** (*Rostov State University of Civil Engineering, Rostov-on-Don, **Russia***)  
Suboptimal Stochastic Control Synthesis for 3D Orientation of a Gyrostabilized Platform
37. **V.M.Nikiforov, A.A.Gusev, A.K.Kovalev, O.G. Vasilieva** (*Federal State Unitary Enterprise «Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making», Moscow, **Russia***)  
Synthesis of the Motion Control Principle for the Single-Axis Gyrostabilized Platform by Genetic Algorithm

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38. **A.V.Polushkin, R.V.Ermakov, N.A.Kaldymov, S.F.Nakhov** (*PC KORPUS, Branch of FSUE N.A.Pilyugin “NPCAP”, Saratov, Russia*), **A.V.Voronkov, R.A.Podrugin, S.Yu.Vinogradov** (*Academician Pilyugin Center, Moscow, Russia*)  
Algorithms, Techniques and Practical Results of Quality Check Automation of Precision Linear Accelerometers
39. **A.V.Polushkin, R.V.Ermakov, N.A.Kaldymov, S.F.Nakhov** (*PC KORPUS, Branch of FSUE N.A.Pilyugin “NPCAP”, Saratov, Russia*), **D.B.Pukhov, A.A.Yankovsky** (*D.I.Mendeleyev Institute for Metrology (VNIIM), Saint Petersburg, Russia*)  
Development and Practical Application of the Automatic Angular Measuring Complex for Testing of Rotary Tables
40. **A.V.Polushkin, R.V.Ermakov, N.A.Kaldymov, S.F.Nakhov** (*PC KORPUS, Branch of FSUE N.A.Pilyugin “NPCAP”, Saratov, Russia*), **P.K.Plotnikov, L.A.Lissitsky** (*Yuri Gagarin State Technical University of Saratov, Saratov, Russia*)  
Increasing the Positioning Accuracy of a Precision Rotary Table Platform by Implementing Friction Control Algorithms

10.25 – 10.40

**DISCUSSION OF THE POSTER PAPERS**

10.40 – 11.10

**COFFEE BREAK**

## SESSION II - INERTIAL SYSTEMS AND SENSORS

Chairmen – **Prof. D.P. Lukyanov**, Russia  
**Prof. H. Sorg**, Germany

### INVITED PAPER

- 11.10 – 11.55      41. **A. Landragin, J. Lautier, I. Dutta, T. Hardin, R. Geiger, C. Garrido Alzar, S. Merlet, F. Pereira Dos Santos** (*LNE-SYRTE, Observatoire de Paris, Paris, France*)  
Cold Atoms Interferometers for Navigation

### PLENARY PAPERS

- 11.55 – 12.15      42. **Yu.N.Korkishko, V.A.Fedorov, V.E.Prilutskiy, V.G.Ponomarev, I.V.Morev, D.V.Obuhovich, S.V.Prilutskiy, S.M.Kostritskiy, I.V.Fedorov, A.I.Zuev, V.K.Varnakov** (*Optolink RPC LLC, Zelenograd, Moscow, Russia*)  
High-Precision FOG with an Extended Dynamical Range
- 12.15 – 12.35      43. **D. Kalantarov, C. Search** (*Stevens Institute of Technology, Hoboken, NJ, USA*)  
Sensitivity Limits of Coupled Resonator Optical Waveguide (CROW) Gyroscopes when Subject to Material Losses
- 12.35 – 12.55      44. **I.G. Deyneka, I.K. Meshkovskiy, G.P.Miroshnichenko** (*Saint Petersburg National Research University of Information Technologies, Mechanics and Optics, Saint Petersburg, Russia*),  
**A.V. Rupasov** (*Concern CSRI Elektropribor, JSC, St. Petersburg, Russia*), **V.E. Strigalev, I.A. Sharkov** (*Saint Petersburg National Research University of Information Technologies, Mechanics and Optics, Saint Petersburg, Russia*)  
Influence of Thermal Effect on Performances of the Fiber Optic Gyroscope
- 13.00 – 14.00      LUNCH

Chairmen – **Dr. Yu.A. Litmanovich**, Russia  
**Dr. J. Mark**, USA

## PLENARY PAPERS

- 14.00 – 14.20      45. **J. Beitia, C. Fell, I. Okon, P. Sweeney, D. Simonenko** (*INNALABS Ltd, Dublin, Ireland*)  
Low Cost CVG for High-Grade North Finders and Targeting Systems
- 14.20 – 14.40      46. **E.L.Mezhiritskij, A.I.Sapozhnikov, E.S.Smirnov** (*FSUE Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making, Moscow, Russia*), **V.I.Grebennikov, L.Ya. Kalikhman, D.M.Kalikhman, S.F.Nakhov, V.M.Pozdnyakov, V.V.Skorobogatov** (*PA Korpus, Branch of FSUE Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making, Saratov, Russia*),  
Heatless Thermo-Invariant Angular Velocity and Linear Acceleration Sensors

## POSTER PAPERS <sup>1</sup>

- 14.40 – 15.20      47. **S.F.Konovalov, D.V. Maiorov, V.P.Podchezertsev, Yu.A.Ponomarev** (*Bauman Moscow State Technical University, Russia*), **R.A.Denisov, V.A.Merkulov, V.A.Sivov, S.Yu.Yurmanov** (*Arzamas Instrument Plant JSC, Russia*)  
Navigation-Grade Hybrid MEMS Servo-Accelerometer
48. **Ya.A.Nekrasov, N.V.Moiseev, S.V.Pavlova, R.G.Lukshonkov** (*Concern CSRI Elektropribor, JSC, St. Petersburg, Russia*)  
Improving the Performance of the Russian RR-type MEMS Gyro

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49. **A.A.Maslov, I.V.Merkuryev, V.V.Podalkov**  
(*Moscow Power Engineering Institute, Moscow ,  
Russia*)  
Methods for Improving the Accuracy of Parameter  
Identification of a Micromechanical Vibrating Gyro
50. **I.V.Popova, A.V.Zemskov, V.A.Ivanov,  
A.M.Lestev, O.I.Rakitynskiy, A.A.Semenov,  
A.A. Shabrov, M.V.Fedorov** (*JSC GYROOPTICS,  
St. Petersburg, Russia*)  
Evolution of Micromechanical Inertial Sensors  
and Navigation and Control Systems
51. **V.Ya. Raspopov, V.V. Matveev, V.V. Likhosherst,  
V.V.Turchaninov** (*Tula State University, Tula,  
Russia*)  
Computational Analytical Module for CAD System of  
the Micromechanical Navigation Devices
52. **B.V.Klimkovich** (*SPLLC “OKB TSP”, Minsk,  
Belarus*)  
Measuring Backscattering Parameters of a Dithered  
RLG in Operation Using the Adaptive Kalman Filter
53. **A.E.Fyodorov, V.A.Zborovsky, D.A.Rekunov**  
(*Ramenskiy Manufacturing Plant, Moscow, Russia*)  
Estimation of RLG Resonator Accuracy Parameters  
in the Process of Production
54. **Yu.Yu.Broslavets, M.A.Georgieva, A.A.Fomitchev**  
(*Moscow Institute of Physics and Technology (State  
University), JSC “Lasex” Dolgoprudny, Moscow  
region, Russia*)  
Mode-Locking in an RLG with a Semiconductor  
Optical Amplifier and a Fiber Cavity

55. **G.G.Akchurin** (*Institute of Precise Mechanics and Control of RAS, Saratov State University, Saratov, Russia*), **G.G.Akchurin** (*Institute of Precise Mechanics and Control of RAS, Saratov, Russia*), **D.V.Obukhovich**, **V.V.Shestakov** (*SPC "Optolink", Saratov branch, Saratov, Russia*), **A.D.Turygin** (*Saratov State University, Saratov, Russia*)  
The Effect of the Finite Coherence Time of a Superluminescent Diode on a FOG Scale Factor
56. **V.E.Dzhashitov**, **V.M.Pankratov** (*Precision Mechanics and Control Institute, Russian Academy of Sciences, Saratov, Russia*), **M.V.Efremov**, **A.V.Romanov** (*ANTARES Research and Development Enterprise (Limited Liability Company), Saratov, Russia*)  
An Active Thermal Control System on Peltier Modules for a Strapdown IMU Based on FOG for Space and Ground Applications
57. **W. Guan** (*Science and Technology on Inertial Laboratory of Beijing University of Aeronautics & Astronautics(BUAA), Beijing, China*), **X.M. Dong**, **Z.H.Long**, **L.Xiong**, **J.Z. Zhao** (*Changcheng Institute of Metrology & Measurement, Beijing, China*), **X.F. Meng** (*Science and Technology on Inertial Laboratory of Beijing University of Aeronautics & Astronautics(BUAA), Beijing, China*)  
Testing of Rectification Error with Double Centrifuge
58. **V.M.Nikiforov**, **V.A.Illarionov** (*Federal State Unitary-Enterprise «Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making», Moscow, Russia*), **O.V. Bakhmetieva** (*Branch of Federal State Unitary-Enterprise «Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making» – «Plant «STAR»*)  
Influence of the Gyroscopic Electric Drive on the Error of the Monoaxial Gyrostabilizer

- 15.20 – 15.30                    **DISCUSSION OF THE POSTER PAPERS**
- 15.30 – 16.00                    **COFFEE BREAK**

### **PLENARY PAPERS**

- 16.00 – 16.20            59. **O.Yu.Zlatkin, S.V.Oleynik, A.V.Chumachenko, Yu.A.Kuznyetsov, V.D.Kozhuhov** (*Research Production Enterprise Hartron-Arkos, Kharkov, Ukraine*), **V.B.Uspensky, A.V. Gudzenko** (*National Technical University «Kharkov Polytechnic Institute», Kharkov, Ukraine*)  
The Development of a High-Precision Strapdown Inertial System Based on Medium-Accuracy Fiber-Optic Gyroscopes for Rocket and Space Applications
- 16.20 – 16.40            60. **S.A. Kolyadin** (*JSC "Concern "Avionics", Moscow, Russia*) **E.N. Bochkova, A.A. Zhikhareva, P.V. Larionov, M.S. Makarov, A.A. Fomichev** (*Moscow Institute of Physics and Technology (State University), Dolgoprudny, Moscow region, Russia*), **T.N. Vahitov, A.B. Kolchev, K.Yu. Schastlivec, V.B. Uspensky** (*JSC "LASEX", Dolgoprudny, Moscow region, Russia*)  
Developing a Fault-Tolerant High Precision Strapdown INS Using Redundant Medium-Accuracy Gyroscopes

### **POSTER PAPERS <sup>1</sup>**

- 16.40 – 17.20            61. **D.G. Gryazin** (*State Research Center of the Russian Federation Concern CSRI Elektropribor, JSC, St. Petersburg, Russia*), **V.Ya. Raspopov, R.V.Alaluev, Yu. V. Ivanov** (*FGBEI HPE 'Tula State University', Tula, Russia*)  
Using a Physical Pendulum for the Measuring Motion Parameters of the Waverider Buoy and Track Railway Machines

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62. **Yu.A.Kuznyetsov** (*Research Production Enterprise Hartron-Arkos, Kharkov, Ukraine*), **Yu. A.Plaksiy** (*National Technical University «Kharkov Polytechnic Institute», Kharkov, Ukraine*)  
Algorithms for Strapdown Inertial Orientation Systems of Moving Objects: Practical Aspects of the Development, Error Analysis and Implementation
63. **N.I.Krobka** (*Scientific & Research Institute for Applied Mechanics named after academician V. I. Kuznetsov (Branch of the Center for Ground-Based Space Infrastructure Facilities Operation), Moscow, Russia*)  
On the Influence of Non-Ideal Onboard Time Scale on the Structure of Error Equations and the Accuracy of Strapdown Inertial Navigation Systems
64. **Yu. N.Chelnokov** (*Chernyshevsky Saratov State University, RAS Institute of Precision Mechanics and Control, Saratov, Russia*), **S.E.Perelyaev** (*Moscow Institute of Electromechanics and Automatics, Moscow, Russia*)  
New Equations and Algorithms of SINS Orientation and Navigation in Four-Dimensional Skew-Symmetric Operators
65. **A.P.Panov** (*International Public Association - Academy of Navigation and Motion Control, Kyiv, Ukraine*), **V.V Tsysarzh** (*SE RI “Kvant-Radiolokatsiya”, Kyiv, Ukraine*), **S.A.Murakhovsky** (*National Technical University of Ukraine “Kyiv Polytechnic Institute”, Kyiv, Ukraine*)  
Non-Traditional “Tangent” and “Cotangent” Rotation Vectors of Rotation in Orientation and Navigation Problems



66. **L.V. Vodicheva, Yu.V. Parysheva, E.L. Alievskaya** (*FSUE "Academician N.A. Semikhatov Scientific and Production Association of Automatics", Yekaterinburg, **Russia***)  
 Prelaunch Alignment and Calibration of a Hybrid Inertial Measurement System
67. **A.V. Kozlov, I.E. Tarygin, A.A. Golovan** (*Moscow State University, Moscow, **Russia***)  
 Calibration of Inertial Measurement Units on a Low-Grade Turntable with Simultaneous Estimation of Temperature Coefficients
68. **A. Dumitrascu, R. D. Tamas** (*Maritime University of Constanta, Constanta, **Romania***), **M.Dragulinescu** (*University POLITEHNICA of Bucharest, Bucharest, **Romania***), **G. Caruntu** (*Maritime University of Constanta, Constanta, **Romania***)  
 A Method of Moments Approach for Decomposition into Elementary Movements of Displacement Data from an Inertial Navigation System
69. **I.A.Rataichuk, V.I.Kortunov** (*N.E. Zhukovsky National Aerospace University «KhAI», Kharkov, **Ukraine***)  
 Analysis of AHRS Complementary Filters
70. **M.V.Chirkin, V.Yu.Mishin, D.A.Morozov** (*Ryazan State Radio Engineering University, Ryazan, **Russia***), **A.A.Golovan** (*Lomonosov Moscow State University, Moscow, **Russia***), **A.V.Molchanov** (*Moscow Institute of Electromechanics and Automatics, Moscow, **Russia***)  
 Filtering Output Signals of a Laser Gyro Triad
71. **D.A.Burov, E.I.Verzunov** (*Russian Scientific Research Institute «Signal» Joint Stock Company (OAO «VNII SIGNAL»), Kovrov, Vladimir region, **Russia***)  
 Creation of Orientation Systems for Mobile Robots

17.20 – 17.40

**DISCUSSION OF THE POSTER PAPERS**

18.30

**DRINK RECEPTION** (at Parusa restaurant)

**WEDNESDAY, 28 MAY**

**SESSION III –SATELLITE SYSTEMS**

Chairmen – **Prof. O.A. Stepanov**, Russia

**Dr. B.V. Shebshaevich**, Russia

**PLENARY PAPERS**

9.30 –9.50

72. **R.N.Akhmetov, G.P.Anshakov, A.I.Manturov, V.I.Rublev** (*TsSKB-Progress State Research-and Production Space Rocket Centre, Samara, **Russia***)  
Principles and Results of Resurs-P Satellite Navigation System Operation

9.50 – 10.10

73. **I.V. Belokonov, A.V. Kramlikh, I.A. Timbai** (*Samara State Aerospace University, Samara, **Russia***), **O.G. Lagno** (*Samara Rocket Space Center “TsSKB-Progress”, Samara, **Russia***)  
Problems of Satellite Navigation and Communications for Nanosatellites Launched as a Piggyback Payload from the Orbital Stage of Carrier Rockets

10.10 – 10.30

74. **N.V.Mikhaylov** (*“R-NAV” LLC, St. Petersburg, **Russia***), **D.A.Koshaev** (*Concern CSRI Elektropribor, JSC, St. Petersburg, **Russia***)  
Spacecraft Positioning in a Geostationary Orbit Using the Model of its Perturbed Motion and the Satellite Navigation Receiver

## POSTER PAPERS <sup>1</sup>

- 10.30 – 10.55
75. **E.I.Ignatovich, A.F.Schekutiev, I.A.Zolkin** (*TSNIImash, Korolev, Moscow region, **Russia***)  
Operative Synchronization of the GLONASS SVs Onboard Time Scales on the Basis of a Set of Intersatellite Measurements Along a Closed Chain (Circuit) of Interactions
  76. **L.P.Barabanova** (*Degtyarev Kovrov State Technological Academy, Kovrov, Vladimir region, **Russia***)  
A New Atmospheric GNSS-Algorithm
  77. **O.O.Barabanov, L.P.Barabanova** (*Degtyarev Kovrov State Technological Academy, Kovrov, Vladimir region, **Russia***)  
On Linear Extrapolation for Differential Mode of GNSS
  78. **P.P.Bogdanov, A.V.Druzhin, A.E.Tiuliakov, A.Yu.Feoktistov** (*“Russian Institute of Radionavigation and Time” JSC, Saint Petersburg, **Russia***)  
GLONASS-GNSS System Time Synchronization for GNSS Interoperability
  79. **A.V.Derevyankin** (*Academician Pilyugin Center, Moscow, **Russia***); **A.I.Matasov** (*M.V. Lomonosov Moscow State University, Moscow, **Russia***)  
Vehicle Localization by Pseudo-Ranges to Reference Points
  80. **I.N.Shestakov, V.V.Panferov, G.A.Kryzhanovskij, O.S.Chernova** (*St. Petersburg State University of Civil Aviation, St. Petersburg, **Russia***)  
ADS-B Ground Stations as Coordinate Information Sources for GNSS Receivers

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<sup>1</sup> 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; further discussion will continue at the posters.

81. **N.V. Mikhaylov** (*Saint Petersburg State University of Aerospace Instrumentation, Saint Petersburg State University of Information Technologies, Mechanics and Optics, St. Petersburg, Russia*), **V.V.Chistyakov** (*R-Nav Ltd., Saint Petersburg State University of Information Technologies, Mechanics and Optics, St. Petersburg, Russia*)  
Analysis of Self-Interference in Tracking Loops of GPS Receivers

10.55 – 11.10

**DISCUSSION OF THE POSTER PAPERS**

11.10 – 11.40

**COFFEE BREAK**

11.40 – 13.00

**PANEL DISCUSSION “Intelligent Orientation and Navigation Systems for Autonomous Mobile Platforms: Development Problems and Prospects”**

Moderators:

Corresponding member of the Russian Academy of Sciences Dr. Sci., Prof. **G.P. Anshakov**, Russia,  
Dr. Sci. Prof. **P.K. Kuznetsov**, Russia

All the interested conferees are welcome.

13.00 – 14.00

**LUNCH**

14.00 – 15.30

**PANEL DISCUSSION (Continued)**

15.30 – 15.45

**CLOSING CEREMONY**