PROGRAM

MONDAY, 28 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
Dr. G. Schmidt, USA

PLENARY PAPERS


10.35–10.55  2. C. Doer, G. Scholz, J. Ruppelt (Institute of Systems Optimization (ITE), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany), G.F. Trommer (Institute of Systems Optimization (ITE), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany; ITMO University, Saint Petersburg, Russia) Inertial Sensor Data Based Motion Estimation Aided by Image Processing and Differential Barometry

10.55–11.25  COFFEE BREAK

PLENARY PAPERS

11.25–11.45  3. N.V. Krapukhina, R.V. Senchenko (The National University of Science and Technology MISiS, Moscow, Russia) Specific Features of Methods and Algorithms for Planning Unmanned Vehicles’ Routes in Dynamically Changing Road Scene
11.45–12.05  4.  D. Kwaśniak, S. Cellmer, K. Nowel (University of Warmia and Mazury in Olsztyn Institute of Geodesy, Olsztyn, Poland) Precise Positioning Using the Modified Ambiguity Function Approach with Combination of GPS and Galileo Observations

POSTER PAPERS ¹


7.  H. Benzerrouk (Polytechnic School of Montreal, Automation and Systems, Montreal, Canada), A.V. Nebylov (State University of Aerospace Instrumentation, Saint Petersburg, Russia) Robust IMU/UWB Integration for Indoor Pedestrian Navigation

8.  K.H. Kou, D.Q. Tang, Y. Chen (Dept. Control Engineering, Naval Aeronautical and Astronautical University, Yantai, P.R. China) Two-Stage INS Error Cooperative Modification Method for Unmanned Aerial Vehicle Formation

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; further discussion will continue at the posters
9. M.Yu. Tkhorenko, B.V. Pavlov, E.V. Karshakov, A.K. Volkovitsky (*V.A. Trapeznikov Institute of Control Sciences, Moscow, Russia*)
On Integration of a Strapdown Inertial Navigation System with Modern Magnetic Sensors

10. Y. Zhao, M. Yan, C. Song, D. Xiong (*Tianjin Navigation Instrument Research Institute, Tianjin, P.R. China*)
Vehicle Dynamic Model-Based Integrated Navigation System for Land Vehicles

11. A.A. Zhilenkov, A.V. Ivanov (*ITMO University, Saint Petersburg, Russia*)
Motion Capture System Based on Inertial MEMS-Technology for Control of Antropomorphous Robotics
**PAPER WAS NOT PRESENTED**

12. Q. Yang, K. Wang, S. H. Li, Y. Liu, Q. W. Fu (*School of Automation, Northwestern Polytechnical University (NPU) Xi’an, P.R. China*)
A Low-Cost Attitude Determination Algorithm Based on MEMS IMU/Dual-Antenna GNSS Receiver for UAVs

13. K.A. Neusypin, M.S. Selezneva, A.V. Proletarsky (*Bauman Moscow State Technical University, Moscow, Russia*), Kai Shen (*School of Automation, Beijing Institute of Technology, Beijing, P.R. China*)
Algorithm for Building Models of INS/GNSS Integrated Navigation System Using the Degree of Identifiability

14. B. Wang, J. Liang, Y.G. Wang, H.N. Weng, Q. Zhang (*Tianjin Navigation Instrument Research Institute, Tianjin, P.R. China*)
SINS/USBL Integrated Navigation Fault-Tolerant Method with Chi-Square Test

15. A.A. Fedotov, S.Yu. Perepelkina, V.M. Kutovoy, O.I. Maslova (*Scientific and Production Association of Automation named after the academician N.A. Semikhatov, JSC, Yekaterinburg, Russia*)
Using High-Order Signal Variance Moments to Evaluate Noise Characteristics of Measuring Channels
16. A.A. Golovan, E.V. Gorushkina, I.A. Papusha  
(Lomonosov Moscow State University, Moscow, Russia)  
On the Method of Parameterization Instrumental Errors for  
a Gravity Gradiometer

17. B.V. Klimkovich (Scientific Production Limited Liability  
Company “OKB TSP”, Minsk, Belarus)  
Replacement of Kalman Filter with a Finite Impulse  
Response Filter to Stabilize the System

18. A.S. Solonar, P.A. Khmarskiy, A.A. Mihalkovskiy,  
S.V. Tsuprik (Military Academy of the Republic of  
Belarus, Minsk, Belarus)  
Features of Trajector Measurement Coordinates and  
Parameters of Movement of Ground Objects in On-Board  
Optical-Location Systems

19. Yu.L. Avanesov (Concern CSRI Elektropribor, JSC, Saint  
Petersburg, Russia), A.S. Voronov, M.I. Evstifteev  
(Concern CSRI Elektropribor, JSC, ITMO University, Saint  
Petersburg, Russia)  
Relative Velocity Sensor for Deep-Sea Vehicles

12.50  
DISCUSSION OF THE POSTER PAPERS

13.00 – 14.00  
LUNCH

Chairmen: Prof. O.A. Stepanov, Russia  
Prof. X.X. He, P.R. China

PLENARY PAPERS

14.00–14.20  
20. V.D. Dishel, E.L. Mezhiritskiy, O.S. Poyatsyka,  
N.V. Sokolova (Academician Pilyugin Scientific-  
Production Center of Automatics and Instrument-Making,  
Moscow, Russia)  
The Technology of Interval-Dynamic Estimation and  
Identification as a Method of Increasing Accuracy and  
Fault-Tolerance of Space Launch Vehicle Control  
Systems of Today and Next Generations
14.20 – 14.40

21. **S. B. Wang, Y. J. Zhang, F. X. Zhu** *(Dalian Maritime University, Dalian, P.R. China)*

Monocular Visual Slam Algorithm for Autonomous Vessel Sailing in Harbor Area

**POSTER PAPERS**

14.40–15.25

22. **A. S. Nosov, O. A. Stepanov** *(Concern CSRI Elektroprivor, JSC, ITMO University, Saint Petersburg, Russia)*

The Effect of Measurements Preprocessing on the Accuracy of Map-Aided Navigation

23. **O. A. Stepanov, A. B. Toropov** *(Concern CSRI Elektroprivor, JSC, ITMO University, Saint Petersburg, Russia), V. A. Vasiliev* *(Concern CSRI Elektroprivor, JSC, Saint Petersburg, Russia)*

Solution of Map-Aided Navigation Problem Using Polynomial Filtering Algorithm


On Reliability of Data Transmission and Distance Estimation Using Mobile Underwater Acoustic Modems

25. **A. Yu. Knyazhsky, A. V. Nebylov** *(St. Petersburg State University of Aerospace Instrumentation, St. Petersburg, Russia)*

Optimization of 3D Motion Trajectory of a Non-Displacement Marine Vehicle Near the Sea Surface According to the Criterion of Minimum Mean Geometric Altitude

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26. **N.V. Kamenov, N.V. Krapukhina** *(National University of Science and Technology, Moscow, Russia)*
Method of Local Navigation for Road Scene
Reconstruction in High-Speed or Dense Traffic Flow Based on Two On-Board Video Cameras
**PAPER WAS NOT PRESENTED**

27. **D.A. Bedin, A.G. Ivanov, A.A. Fedotov** *(Krasovskii Institute of Mathematics and Mechanics of the Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russia)*
Recovering the Aircraft Trajectory by Using the Detection of the Motion Type

28. **D.A. Bedin** *(Krasovskii Institute of Mathematics and Mechanics, Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russia)*
Problem of Multilateration with Several Signal Transmission Instants

29. **O. Serçekman** *(Middle East Technical University, Roketsan Missiles Industry Inc., Ankara, Turkey)*,
**A.T. Kutay** *(Middle East Technical University, Ankara, Turkey)*
A Model Based Approach for Sensor Fault Detection in Civil Aircraft Control Surface
**PAPER WAS NOT PRESENTED**

30. **V.I. Baburov, N.V. Ivantsevich, O.I. Sauta** *(JSC AUSRIRE, NTC Navigator, St. Petersburg, Russia)*
GNSS-Based Technique of Error Matrix Construction for Radio-Technical Short-Range Navigation and Landing Systems

31. **H. Guo** *(Nanchang University, Institute of Space Science and Technology, Nanchang, P.R. China)*,
**M. Uradzinski** *(University of Warmia and Mazury in Olsztyn, Institute of Geodesy, Olsztyn, Poland)*
The Usability of MTI IMU Sensor Data in PDR Indoor Positioning
32. Zh.S. Pershina, S.Ya. Kazdorf, V.A. Abrosimov  
(Novosibirsk State Technical University, Novosibirsk, Russia)  
Application of Algorithms for Object Recognition Based on Deep Convolutional Neural Networks for Visual Navigation of a Mobile Robot

33. D. Tang, K. Kou (Naval Aviation University, Yantai, P.R. China), Y. Tang (Nanjing University of Information Science and Technology, Nanjing, P.R. China)  
Automatic Landing System of Shipboard UAV Based on Integration of INS, DGPS and Vision by Adaptive Filtering

PAPER WAS NOT PRESENTED

34. V.V. Lyubimov (Samara University, Russia)  
Calculation of the Landing Area for a Small Asymmetric Martian Probe under the Action of the Magnus Gyroscopic Moment

35. O.S. Amosov (Komsomolsk-na-Amure State University, Russia)  
Peculiarities of Stochastic Processes with Fractal Properties and Their Applications in Problems of Navigation Information Processing

36. R.V. Alaluev, M.V. Ryabtsev (Tula State University, Russia)  
Application of Neuro Network Modeling for Calibration of Pyrometric System for Unmanned Aircraft Orientation

15.25 DISCUSSION OF THE POSTER PAPERS
15.30–16.00 COFFEE BREAK

Chairmen: Prof. I.M. Okon, Russia, USA
Prof. G. Trommer, Germany

PLENARY PAPERS

16.00–16.20

37. V.N. Tyapkin, V.N. Ratushnyak, D.D. Dmitriev, A.B. Gladyshev, A.M. Mandranov (Siberian Federal University, Krasnoyarsk, Russia)  
Improving the Efficiency of Noise Suppression by Correcting the Frequency Characteristics of Receiving Channels in Satellite Navigation Equipment
38. O. Bălan, M.-I. Dascălu, A. Moldoveanu (University POLITEHNICA of Bucharest, Bucharest, Romania), S. Caraiman, F. Ungureanu, R. Lupu, A. Stan («Gheorghe Asachi» Technical University of Iasi, Romania)

Brain Activation During Virtual and Real-World Mobility Tasks with Single And Multimodal Sensory Input Provided by an Assistive Navigational Device for Visually Impaired People

39. I.N. Burdinsky (The office of Scientific Research, Pacific National University, Khabarovsk, Russia), S.A. Otcheskiy (Institute of Marine Technology Problems of the Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia)

Assessment of the Possibility of Underwater Navigation Support for Autonomous Underwater Vehicles at Long Ranges

POSTER PAPERS

40. Yu.V. Bolotin, V.S. Vyazmin (Lomonosov Moscow State University, Moscow, Russia)

Accuracy Analysis of the Airborne Vector Gravimetry Algorithm Based on Two-Dimensional Random Fields for Gravity Modeling

41. S.V. Shafran, E.A. Gizatulova, I.A. Kudryavtsev (Samara National Research University, Samara, Russia)

Snapshot Technology in GNSS Receivers

42. H. Buchner, B.I. Ahmad, S. Godsill (Cambridge University, Cambridge, United Kingdom), K. Helwani (Huawei European Research Center, Munich, Germany)

A Novel Class of Bayesian Algorithms for Array-Based Scene Analysis in Time-Varying Convolutive Scenarios with Special Focus on Stochastic Motion Models

PAPER WAS NOT PRESENTED

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; further discussion will continue at the posters
43. I.O. Osipov, P.A. Yurovskikh, V.I. Shiryaev (South Ural State University (National Research University), Chelyabinsk, Russia)
   An Approach to the Synthesis of Control under Uncertainty

44. I.O. Osipov, P.A. Yurovskikh, V.I. Shiryaev (South Ural State University (National Research University), Chelyabinsk, Russia)
   Preprocessing of Measurements and Estimation of the Disturbances as Methods to Increase the Accuracy of the Guaranteed Estimation Algorithm

45. V.M. Nikiforov, I.Yu. Bykanov (Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making, Moscow, Russia)
   CAD – Technology of Cross-Cutting Design of Dynamic Systems

46. I.A. Tsikin, E.A. Shcherbinina (Institute of Physics, Nanotechnology and Telecommunications, Peter the Great St.Petersburg Polytechnic University, Russia)
   Algorithms of GNSS Signal Processing Based on the Generalized Maximum Likelihood Criterion for Attitude Determination

47. A.P. Melikhova, I.A. Tsikin (Institute of Physics, Nanotechnology and Telecommunications, Peter the Great St.Petersburg Polytechnic University, Russia)
   Decision-Making Algorithms Based on Generalized Likelihood Ratio Test for Angle-of-Arrival GNSS Integrity Monitoring

48. Yu.N. Chelnokov (RAS Institute of Precision Mechanics and Control, Saratov, Russia)
   Inertial Navigation in Space Using Quaternion Regular Equations of Astrodynamics

17.30–17.50 DISCUSSION OF THE POSTER PAPERS
18.00–21.30 SIGHT-SEEING GUIDED TOUR OF SAINT PETERSBURG
TUESDAY, 29 MAY

SESSION II – INTEGRATED SYSTEMS
(Continued)

Chairmen: Dr. Yu.A. Litmanovich, Russia
Dr. J. Mark, USA

PLENARY PAPERS
Aircraft High Accuracy Positioning During Approach to a Platform Using Laser System with the GNSS Signals Outage

9.20–9.40  50. B.I. Ahmad, H. Buchner, P.M. Langdon, S.J. Godsill (University of Cambridge United Kingdom)
A Bayesian Framework for Intent Prediction in Object Tracking

POSTER PAPERS
9.40–10.05  51. M.N. Mikhaylov (Lyceum 239, St. Petersburg, Russia), I.A. Lositskii (Creative Robotics Lab, ITMO School of Computer Technologies and Control, St. Petersburg, Russia)
Application of Neural Networks for Forest Robot

52. A.V. Pesterev, Yu.V. Morozov (V.A. Trapeznikov Institute of Control Sciences, Russian Academy of Sciences, Javad GNSS, Moscow, Russia), I.V. Matrosov, J. Ashjaee (Javad GNSS, Moscow, Russia)
Estimation of the Magnetic Field Generated by UAV in Flight

Methods of System Specification Evaluation in Flights at High Latitudes

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54. **R. Pelc-Mieczkowska** (Institute of Geoinformation and Cartography, University of Warmia and Mazury in Olsztyn (UWM), Olsztyn, **Poland**), **D. Tomaszewski** (Institute of Geodesy, University of Warmia and Mazury in Olsztyn (UWM), Olsztyn, **Poland**)

GNSS Terrain Obstacle Modelling Using Fisheye Lense for Smartphones

55. **A.V. Polushkin, D.G. Borchaninov, I.V. Slistin, N.A. Kaldymov, S.F. Nakhov** (Branch of the Federal State Unitary Enterprise “Academician Pilyugin Scientific-production Center of Automatics and Instrument-making” – Production Association “Korpus”, Saratov, **Russia**), **N.N. Brysin, N.A. Stroilov, E.A. Bazina, N.A. Slivko, V.A. Budkov** (Space Research Institute of the Russian Academy of Sciences (IKI RAN), Moscow, **Russia**)

Results of Application of a Hardware and Software Complex for Determining the Methodical Error of Star Trackers

56. **S.B. Berkovich, N.I. Kotov, R.N. Sadekov, A.V. Sholokhov, R.R. Bikmayev** (Interregional Public Organization «Institute of Engineering Physics», Serpukhov, **Russia**), **D.E. Bystrov** (Office of Advanced Inter-Specific Research and Special Projects, Moscow, **Russia**)

Recognition of Switch Layouts in the Task of Rolling Stock Positional Navigation

57. **A.V Sholokhov, S.B. Berkovich, N.I. Kotov, R.N. Sadekov** (Inter-Regional Public Institution «Institute of Engineering Physics», Serpukhov, **Russia**)

Forming a Trajectory of a Map-Matching Navigation System by the Criterion of Minimum Coordinate Errors

58. **X.M. Xing, Y.T. Zhang** (Beijing Institute of Aerospace Control Devices, **P.R. China**)

Small and Low-Cost Navigation Device for Pedestrian
59. B.I. Adamov (National Research University MPEI, Moscow, Russia)
Influence of Mecanum Wheels Construction on Accuracy of the Omnidirectional Platform Navigation (On Example of KUKA youBot Robot)

SESSION III - INERTIAL SYSTEMS AND SENSORS

Chairmen: Dr. A.V. Sokolov, Russia
Mr. L. Camberlein, France

INVITED PAPER

10.05 – 10.50 60. George Schmidt (USA)
Navigation Sensors and Systems in GNSS Degraded and Denied Environments 2018 (Or How I Learned to Stop Worrying about GPS)

10.50 DISCUSSION OF THE POSTER PAPERS (Nos. 51-59)

10.55–11.25 COFFEE BREAK

PLENARY PAPERS

11.25–11.45 61. F. Delhaye, J.-Ph. Girault (Safran Electronics & Defense, Boulogne-Billancourt, France)
SPACENAUTE: HRG Technological Breakthrough for Advanced Space Launcher Inertial Reference System

11.45–12.05 62. V.M. Achildiev, V.A. Soldatenkov, N.A. Bedro, Yu.K. Gruzevich, Yu.N. Evseeva, A.D. Levkovitch (SPU GEOPHIZIKA-NV St. Com, Moscow, Russia)
M.A. Basarab, N.S. Konnova (Bauman Moscow State Technical University, Russia)
Cardioseismometer Unit Based on Micromechanical Sensors
POSTER PAPERS

12.05–12.50

63. V.Ya. Raspopov, I.A. Volchikhin (FSBEI HE «Tula State University», Tula, Russia)
Solid-State Wave Gyroscope. Ensuring the Required Accuracy Parameters

64. R.V. Ermakov, E.N. Skripal, A.A. Seranova, D.E. Gutsevich (JSC «Design Bureau of Industrial
Automatics», Saratov, Russia), D.V. Kondratov (Saratov Branch of RANEPA, Saratov, Russia), A.A. L’vov (Yuri Gagarin State Technical University of Saratov, Saratov, Russia)
Development of a Vibrational Error Model of a Hemispherical Resonator Gyroscope

65. A.A. Maslov, D.A. Maslov, I.V. Merkuryev, V.V. Podalkov (National Research University «Moscow Power Engineering Institute», Moscow, Russia)
Methods to Eliminate Nonlinearity of Electrostatic Control Sensors of the Wave Solid-State Gyroscope

66. B.S. Lunin (Lomonosov Moscow State University, Moscow, Russia), M.A. Basarab, A.V. Yurin (Bauman Moscow State Technical University, Moscow, Russia), E.A. Chumankin (JSC “ANPP “TEMP-AVIA”, Arzamas, Russia)
Fused Quartz Cylindrical Resonators for Low-Cost Vibration Gyroscopes

67. B. Yang, Y. X. Xu, Q. F. Hu, C. Y. Xing, X. Rui (Beijing Institute of Aerospace Control Devices, Beijing, P.R. China)
Research on Digital Closed-Loop Control for Silicon Resonant Accelerometer

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68. **B.H. Liu, W. Luo, L. Ma, X.L. Wu, X. M. Zhao** *(Tianjin Navigation Instrument Research Institute, Tianjin, P.R.China)*

Analysis of the Instability of the FOG Scale Factor Induced by the Fiber Coil Adhesive Thermal Stress

**PAPER WAS NOT PRESENTED**

69. **A.V. Molchanov** *(JAS «Moscow Institute of Electromechanics & Automatisches»; Moscow, Russia), M.V. Chirkin, A.E. Serebryakov, V.V. Klimakov, H.N. Dao, V.Yu. Mishin* *(Ryazan State Radio Engineering University; Ryazan, Russia)*

The Effect of Slow Fluctuation Processes in the Ring Laser Gyroscope on Its Bias Instability

70. **E.A.Petrukhin** *(Metallist Serpukhov Plant, JSC, Serpukhov, Polus Research Institute named after M.F. Stelmakh, Moscow, Russia), A.S.Bessonov* *(Moscow Technological University (MIREA), Moscow, Russia)*

Lock-in Threshold Minimization in a Laser Gyro at the Step of Assembling and Alignment of a Ring Cavity

71. **Yu.Yu. Broslavets, A.A. Fomichev** *(Moscow Institute of Physics and Technology (State University), JSC "Lasex", Dolgoprudny, Russia), D.M. Ambartsumyan, N.S. Kalmykova, E.A. Polukeev* *(Moscow Institute of Physics and Technology (State University), Russia)*

Controlling the Coupling of Counterpropagating Waves in a Laser Gyroscope with a Nonplanar Cavity when Working with a Zeeman Dither

72. **W.L. Zhao, L.X. Zhang, Y. X.Cheng, Q. Fan, S.L. Li, Y. Su, D.W. Zheng, L.Y. Fan, Y.J. Rong, J. M.Wu** *(Nanjing University of Science and Technology, Nanjing; Shanghai Aerospace Control Technology Institute; Shanghai Engineer Research Center of Inertia, P.R. China)*

Study on High Precision Control Circuit of Disk MEMS Gyroscope

**PAPER WAS NOT PRESENTED**
73. **M.A. Barulina** (*Institute of Problems of Precise Mechanics and Control of the Russian Academy of Sciences, Saratov, Russia*) I.V. Papkova, A.V. Krysko (*Yuri Gagarin State Technical University of Saratov, Saratov, Russia*)
   Dynamics of the Round Sensing Element of a Nanoelectromechanical Sensor

74. **A.S. Shalimov, S.P. Timoshenkov, V.V. Kalugin** (*Institute NMST MIET, Moscow, Russia*)
   Design Route for 3-Axis MEMS Accelerometer Optimized by Selected Parameters
   **PAPER WAS NOT PRESENTED**

75. **E.N. Pyatyshev, Ya.B. Enns, Ya. A. Nekrasov** (*Peter the Great Saint Petersburg Polytechnic University, Russia*)
   A Sensing Element for a High-Precision Micromechanical LL-Type Gyroscope

76. **E.N. Pyatyshev, Ya.B. Enns, R.V. Kleimanov, I.M. Komarevtsev, A.N. Kazakin** (*Peter the Great Saint-Petersburg Polytechnic University, Russia*)
   Increasing the Capacity of Micromechanical Gyroscope Comb Actuator Using Bistable Suspension

77. **V.F. Zhuravlev** (*Institute of Applied Mathematics of RAS, Russia*), B.E. Landau (*Concern CSRI Elektropribor, JSC, St. Petersburg, Russia*), P.K. Plotnikov (*Yury Gagarin State Technical University, Saratov, Russia*)
   An ESG-based Sensor for Measuring Three Angles of Moving Object Rotations: Design Features

12.50 **DISCUSSION OF THE POSTER PAPERS**

13.00–14.00 **LUNCH**
PLENARY PAPERS

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

(Concern CSRI Elektropribor, JSC, St. Petersburg, Russia)
Extension of Navigation Methods on a Basis of the Inertial Principle

14.20–14.40 79. P.Yuan, Y.Yang, G.Chen, Y.Wu (Beijing Aerospace Times Laser Inertial Technology Company, LTD, Beijing, P.R. China)
Research on Moving-Base Ship-Borne SINS Rapid Self-Calibration
PAPER WAS NOT PRESENTED

POSTER PAPERS

14.40–15.30 80. N.B. Vavilova, A.A. Golovan, A.V. Kozlov, I.A. Papusha, N.A. Parusnikov (Lomonosov Moscow State University, Moscow, Russia)
Comparative Study of Several Variants of Strapdown Inertial Navigation System Calibration

81. Y.F. Jiang, S.H. Li (Northwestern Polytechnical University, Xi’an, P.R.China), B. Xie (Xi’an Aerospace Precision Electromechanical Institute, Xi’an, P.R.China)
Gyro-Axis-Based Calibration Method for Rate-Bias Laser-Gyroscope Inertial Navigation System
PAPER WAS NOT PRESENTED

82. I.Kh. Shaimardanov, A.A. Dzuev, A.V. Nekrasov, D.A. Rekunov (JSC «Inertial Technologies of Technocomplex», Ramenskoye-8, Moscow Region, Russia), A.V. Kozlov (Lomonosov Moscow State University, Moscow, Russia)
Synthesis and Results of Experimental Research of the Iterative Calibration Procedure Accuracy Characteristics Providing Labor Input Reduction in SINS Sensitive Elements Calibration Process
PAPER WAS NOT PRESENTED

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83. **Z. Jin, S. H. Li (North-Western Polytechnic University, Xi'an, P.R.China)**
Method for MIMU in-Field Systematic Calibration Through Multi-Position Rotation

84. **V.A. Smirnov, V.V. Savelyev, A.V. Prohortsov (Tula State University, Russia), A.E. Yakovlev (JSC «KBP» named after academician A.G. Shipunov, Tula, Russia)**
Determination of Mutual Orientation of Inertial Modules Mounted on a Moving Object at a Distance from Each Other

85. **B. Li, C. L. Cai, X.T. Meng (Beijing Aerospace Times Optical-electronic Technology CO., Ltd Beijing, P.R.China)**
Backtracking Scheme for Alignment with Strict Reverse Process Based on FOG SINS
**PAPER WAS NOT PRESENTED**

86. **L.N. Belsky, L.V. Vodicheva, Yu.V. Parysheva (JSC «Academician N.A. Semikhatov Scientific and Production Association of Automatics», Yekaterinburg, Russia)**
A Strapdown Inertial Navigation System for Space Launch Vehicles: Initial Alignment Accuracy and Periodic Calibrations

87. **Q. Liang (ITMO University, Saint-Petersburg, Russia), Yu. A. Litvinenko (ITMO University, Concern CSRI Elektroprovibor, JSC, S.-Petersburg, Russia)**
Adaptive Algorithm for Processing Data of an AHRS with Two Units of Micromechanical Gyroscopes

88. **J. Gong, J. Liang, Y.G. Wang, H.N. Weng (Tianjin Navigation Instrument Research Institute, P.R.China)**
On-line Calibration Method of SINS/DVL Integrated Navigation System
89. **V.V. Avrutov** (National Technical University of Ukraine (Igor Sikorsky Kiev Polytechnic Institute), Kiev, **Ukraine**)  
Gyro North and Latitude Finder

90. **M.Yu. Loginov, Yu.N. Chelnokov** (RAS Institute of Precision Mechanics and Control, Saratov, **Russia**)  
Analytical and Numerical Study of Differential Error Equations for Autonomous Strapdown INS Functioning in Normal Geographic Frame

91. **A.V. Molodenkov, Ya.G. Sapunkov** (Institute of Precision Mechanics and Control of RAS, Saratov, **Russia**),  
**T.V. Molodenkova** (Yu. A. Gagarin Saratov State Technical University, Saratov, **Russia**), **S.E. Perelyaev** (Ishlinsky Institute for Problems in Mechanics of RAS, Moscow, **Russia**)  
The Exact Solution of the Bortz Approximate Equation and Construction of the Quaternion Orientation Algorithm of Strapdown INS on its Basis

Improving the Accuracy of an Inertial Measurement Unit of a Spacecraft Control System by Computational Algorithms

93. **D.M. Malyutin** (Tula State University, **Russia**)  
Miniature Gyroscopic Orientation System for Unmanned Aerial Vehicle

94. **V.N. Enin** (Bauman Moscow State Technical University, Moscow, **Russia**), **A.A. Aviev** (NPK «Electrooptika» corp., Moscow, **Russia**)  
Instrumental Errors of Optoelectronic System for Measuring Parameters of Dither System in Ring Laser Gyro

95. **S.Q. Cheng, H.X. Li, D.M. Li, R. Zhang, X.X. He** (Tsinghua University, Beijing, **P.R.China**)  
Selection of Electrodes Geometry for Contactless Suspension of a Conducting Sphere

**15.30 DISCUSSION OF THE POSTER PAPERS**

**15.40–16.10**  
COFFEE BREAK
Chairmen: Dr. Yu.A. Litmanovich, Russia
Prof. G. Trommer, Germany

PLENARY PAPERS

16.10–16.30

96. A.V. Chernodarov, A.P. Patrikeev (NaukaSoft Experimental Laboratory, Ltd., Moscow, Russia), O.A. Karpov («Fazotron-RIR» Corporation, JSC, Moscow, Russia)
In-Flight Development of SINS-500NS Satellite Inertial Navigation System at High Latitudes

16.30–16.50

97. H.Y. Yu, M. Lei, Z. Feng, Y.J. Wu, X. Zheng (Beijing Institute of Automatic Control Equipment, Beijing, P.R. China)
A Novel Resonance Optical Gyroscope Using Photonic Crystal Fiber

16.50–17.10

98. Ya. V. Belyaev, A.A. Belogurov, A.N. Bocharov, D.V. Kostygov, I.V. Lemko, A.A. Mikhteeva, A.V. Yakimova (Concern CSRI Elektropribor, JSC, St. Petersburg, Russia), N.N. Nevirkovets, N.M. Chernetskaya (Concern CSRI Elektropribor, JSC, St. Petersburg Electrotechnical University LETI, St. Petersburg, Russia)
Development of a MEMS-Accelerometer

POSTER PAPERS

17.10–17.35

Automatic Rotary Device for Verification of the Accuracy Characteristics of Strapdown Inertial Navigation System

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**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; further discussion will continue at the posters.
100. V.M. Nikiforov, A.A. Gusev, K.A. Andreev, A.S. Shiryaev, T.A. Zhukova (Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making, Moscow, Russia)
Combined Terminal Control of the Gyrostabilized Platform in the «Coarse» Alignment Mode

Effects of Friction in the Pivots of the Floating Gyro Nodes Leading to Unbalancing

102. V.M. Nikiforov, I.Yu. Bykanov (Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making, Moscow, Russia)
Dynamic Compensating LMI-Controller for Output of the Pendulum Accelerometer

103. A.A. Golozin, N.N. Vinogradov (Joint-Stock Company «Command Devices Research Institute», Saint Petersburg, Russia)
Determining the Drifts of a Gyrostabilized Platform, Non-Linearly Dependent on the Overload

Integrated Approach to the Development of Digital Regulators for Inertial Sensory Elements of Modern Strapdown Inertial Navigation Systems and of Corresponding Control Software
Method to Increase Stability of the Scale Factor of a Precision Pendulum Accelerometer with Digital Feedback

Ways of Extending the Measurement Range and Increasing the Accuracy of Rotary Test Benches with Inertial Sensory Elements for Gyroscopic Devices

17.35–17.55 DISCUSSION OF THE POSTER PAPERS
18.30–21.30 BANQUET (onboard the CITY BLUES boat)

WEDNESDAY, 30 MAY

SESSION IV – SPACECRAFT CONTROL AND NAVIGATION

Chairmen: Corresponding Member of the RAS Prof. G.P. Anshakov, Russia
Dr. N.V. Mikhailov, Russia

PLENARY PAPERS

9.30–9.50 107. I.V. Belokonov, A.M. Bogatyrev, A.V. Kramlikh (Samara University, Russia)
Development and Investigation of Algorithms for Determining Relative Navigation and Orientation Based on Distance Measurements
9.50–10.10 108. **F. Camps, P. R. Arantes Gilz, M. Joldes, C. Louembet** *(LAAS, University of Toulouse, CNRS, Toulouse, France)*
Embedding a SDP-based Control Algorithm for the Orbital Rendezvous Hovering Phases

10.10–10.30 109. **G.P. Anshakov, G.N. Myatov, F.F. Yudakov** *(JSC «Space Rocket Centre «Progress» (JSC «SRC Progress»), Samara, Russia), P.K. Kuznetsov, B.V. Martemyanov* *(Samara State Technical University, Samara Scientific Center of RAS, Samara, Russia)*
Experience of Non-Visual Information Recovery from Video Data Acquired by a Land-Survey Satellite

**POSTER PAPERS**

10.30–11.00 110. **A.A. Prutko, S.N. Atroshenkov** *(S.P. Korolev Rocket and Space Corporation “Energia”, Korolev, Russia)*
Optimal Control of Large Space Construction Maneuvers

111. **Ye. I. Somov, S. A. Butyrin** *(Samara State Technical University, Russia)*
Guidance and Attitude Control of a Land-Survey Satellite at a Scanning Stereoscopic Imagery

112. **Ye.I. Somov, S.A. Butyrin, S.E. Somov** *(Samara State Technical University, Russia)*
Navigation, Guidance and Control of Free-Flying Robot During its Rendezvous with a Passive Space Vehicle

113. **T. E. Somova** *(Samara State Technical University, Samara, Russia)*
Guidance and Economical Digital Control of a Satellite Orientation in Initial Modes

114. **A.V. Kramlikh, I.A. Lomaka** *(Samara University, Russia)*
Nanosatellite’s Rotational Motion Parameters Determination Using Light Sensor and Angular Velocity Sensor Measurements

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115. **I.V. Belokonov, I.A. Lomaka** *(Samara University, Samara, Russia)*
Investigation of the Possibility of Determining the Inertial Characteristics and the Angular Velocity Vector of a Chaotically Rotating Space Debris Using a Nanosatellite

116. **I.V. Belokonov, I.A. Timbai, D.D. Davydov** *(Samara University, Russia)*
Passive Three-Axis Stabilization of a Nanosatellite in Low-Altitude Orbits: Feasibility Study

117. **B. Ahi, M. Haeri** *(Sharif University of Technology, Tehran, Iran)*
Novel Nested Saturated Feedback Scheme for CLOS Guidance via Cubature Kalman Filter

118. **Yu.N. Gorelov, S.B. Danilov, L.V. Kurganskaya** *(Samara National Research University named after academician S. P. Korolev, Samara, Russia)*, **A.I. Manturov, V.E. Yurin** *(JSC SRC Progress, Samara, Russia)*
Optimization of Multiroute Scanning of Geometrically Complex Sensing Zones for Spacecraft with Optoelectronic Observation Equipment

119. **J. Janicka, J. Rapiński, D. Tomaszewski** *(University of Warmia and Mazury in Olsztyn, Poland)*
Extrapolation of Geocentric Orbit Corrections During Loss of Communication Link – Analysis of Different Methods

11.00 **DISCUSSION OF THE POSTER PAPERS**

11.15–11.45 **COFFEE BREAK**
11.45–13.50  **PANEL DISCUSSION** “A Quarter Century of the Conference: Where to Now?”

Moderator: Prof. V.G. Peshekhonov

**INVITED PAPER**

11.45–12.30  120. B.S. Rivkin (*Concern CSRI Elektropribor, JSC, St. Petersburg, Russia*)

25 Years of the Saint Petersburg International Conference on Integrated Navigation Systems

12.30–13.50  Speeches of the Panel Discussion participants (preliminary application is required)

13.50–14.00  **CLOSING CEREMONY**

14.00–15.00  LUNCH