

**28th SAINT PETERSBURG INTERNATIONAL CONFERENCE
ON INTEGRATED NAVIGATION SYSTEMS
31 May - 2 June 2021**

PRELIMINARY PROGRAM¹

MONDAY, 31 MAY

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

10.00 – 10.15 **OPENING CEREMONY**

SESSION I – INTEGRATED SYSTEMS

PLENARY PAPERS

10.15 – 10.35 1. ³ **Yu.V. Bolotin, A.V. Bragin, D.V. Gulevskiy** (*Lomonosov
73² Moscow State University, Moscow, **Russia***)
Comparing the Accuracy of Algorithms for Pedestrian
Navigation Based on Different Methods of Correction

10.35 – 10.55 2. **Christopher Doer, Gert F. Trommer** (*Institute of Systems
53 Control (IRS), Karlsruhe Institute of Technology (KIT),
Karlsruhe, **Germany***)
Yaw Aided Radar Inertial Odometry using Manhattan
World Assumptions

10.55 – 11.25 **COFFEE BREAK**

PLENARY PAPERS

11.25 – 11.45 3. **A.G. Mikov, R.V. Voronov, A.P. Moschevikin**
76 (*Petrozavodsk State University, Petrozavodsk, **Russia***)
A Multialternative Algorithm for Automotive Transport
Positioning Based on Map-Matching and Road Graph
Information

11.45 – 12.05 4. **Shiming Liu, Sihai Li** (*School of Automation,
11 Northwestern Polytechnical University, Xi'an, **China***)
Odometer-Aided Ultra-Tight GPS/MIMU Integration for
Land Vehicle Navigation in Urban Canyons

¹ *The Conference Program Committee reserves the right to make alterations into the final Conference Program*

² *Paper No. in CoMS-Elektropribor system*

³ *Paper No. in the Conference Program*

POSTER PAPERS¹

- 12.05 – 12.50 5. **V.A. Smirnov, A.V. Prohortsov, O.V. Minina** (*Tula State University, Tula, Russia*)
50 Algorithms for Fast Computation of Navigation Parameters of Mobile Objects by the SNS Signals
- 516.** **A.V. Prokhortsov, N.D. Yudakova** (*Tula State University, Tula, Russia*)
Integrated Navigation System with Spaced Accelerometers
- 207.** **Qimin Xu, Chang Bin, Li Xu, Xixiang Liu** (*School of Instrument Science and Engineering, Southeast University, Nanjing, China*)
Vision-IMU Integrated Vehicle Pose Estimation based on Hybrid Multi-Feature Deep Neural Network and Federated Filter
- 898.** **V.N. Kovregin, G.M. Kovregina** (*Saint Petersburg State University of Aerospace Instrumentation, Saint 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
- 629.** **A.V. Savkin, D.A. Antonov, L.A. Kolganov, E.L. Chekhov** (*Moscow Aviation Institute, Moscow, Russia*)
A Method for Autonomous Navigation Based on Integrated Inertial and Opto-Electronic Measurements
- 1210.** **Jiangtao Zheng, Sihai Li, Qiangwen Fu, Yin Lai** (*School of Automation, Northwestern Polytechnical University (NPU), Xi'an, China*)
A Loose Integrated Positioning Method of Longwall Shearer Assisted by INS and Laser Scanner

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

4311. **A.S. Nosov, O.A. Stepanov** (*Concern CSRI Elektropribor, JSC, ITMO University, Saint Petersburg, Russia*)
Algorithm for Planning an Informative Route for Map-Aided Navigation
2712. **E.G. Kharin, I.A. Kopylov, V.A. Kopelovich, L.M. Bardina, A.Yu. Zhabin, A.Yu. Makarova, E.A. Falkov** (*Gromov Flight Research Institute, Zhukovsky, Russia*) Airborne Inertial / Radio-Technical Aids Data Processing Characteristics in Flight and Navigation System
2213. **Sheng Su, Zhihong Deng, Yi Yang** (*Beijing Institute of Technology, Beijing, China*)
Object Tracking and Pose Estimating Based on Camera and Lidar Fusion in Self-Driving Scenario
2814. **K.D. Chekhovskaya** (*SC "DBIA", Saratov, Russia*)
Development of Hardware and Software for Determining the Properties and Suitability of the Earth's Surface for Landing of an Unmanned Aerial Vehicle
715. **V.M. Achildiev, N.A. Bedro, Yu.N. Evseeva** (*"SPU Geofizika-NV" St. Com., Moscow, Russia*),
Yu.K. Gruzevich (*"SPU Geofizika-NV" St. Com., Bauman Moscow State Technical University, Moscow, Russia*),
M.A. Basarab, N.S. Konnova (*Bauman Moscow State Technical University, Moscow, Russia*), **V.M. Uspenskiy** (*Branch of the Military Medical Academy named after S.M. Kirov, Moscow, Russia*)
Diagnostics of Human Internal Organs Based on Biophysical Signals of the Heart
4216. **Ze Chen, Xianfei Pan, Changhao Chen** (*College of Intelligence Science and Technology, National University of Defense Technology, Changsha, China*)
Deep Learning of Zero-Velocity Detection for Inertial Pedestrian Navigation

- 4817.** **A.V. Nemov** (*Russian Institute of Radionavigation and Time, Saint Petersburg, **Russia***), **D.Yu. Tyufiyakov** (*AO “KB NAVIS”, Saint Petersburg, **Russia***)
On the Estimation of Subspaces Dimensionality in the Correlation Analysis of Signals Received and Processed by a GNSS Digital Antenna Array
- 3118.** **A.V. Telny** (*Vladimir State University, Vladimir, **Russia***)
On the Estimation of the Measurement Accuracy of Satellite Navigation Systems Using Dynamic Recursive Correction
- 10019.** **A.A. Kumarin, S.V. Shafran, I.A. Kudryavtsev, V.M. Grechishnikov** (*Samara University, Samara, **Russia***)
A GNSS Signal Tracking Algorithm with Data Reduction

12.50– 13.00 **DISCUSSION OF THE POSTER PAPERS**

13.00 – 14.00 LUNCH

INVITED PAPER

- 14.00 – 14.45 20. **Klaus Schilling** (*Julius-Maximilians-Universität Würzburg, Am Hubland, Würzburg, **Germany***)
Small Satellite Formations: Challenges in Navigation and the Tremendous Application Potential

PLENARY PAPER

- 14.45 – 15.05 21. **V.B. Pudlovskiy** (*Federal State Unitary Enterprise "Russian Metrological Institute of Technical Physics and Radio Engineering", Moscow Region, Mendeleevo, **Russia***)
94 Comparison of GNSS Solution Errors Using an Atomic Clock or Crystal Oscillator

POSTER PAPERS¹

- 15.05 – 15.25 22. **M.S. Selezneva, A.V. Proletarsky, K.A. Neusypin** (*Bauman Moscow State Technical University, Moscow, **Russia***)
34 Correction of the Navigation System of a Re-entry Spacecraft after External Sensors are Disabled

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3523. **A.V. Sholokhov, S.B. Berkovich, N.I. Kotov** (*Inter-Regional Public Institution "Institute of Engineering Physics", Serpukhov, Russia*)
Modeling of Self-Consistent Errors of an Anomalous Gravity Field Transformants in Local Regions
3624. **M.S. Selezneva, K.A. Neusybin, Pham Xuan Truong** (*Bauman Moscow State Technical University, Moscow, Russia*)
A Method for Integrating Measuring Systems of a Space Unmanned Aerial Vehicle
5225. **Shaobo Wang, Yingjun Zhang** (*Institute of Traffic Information Engineering, Dalian Maritime University, Dalian, China*)
An Integrated Navigation Decision-Making System Considering the Real Sea Scenario
7926. **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, Saint Petersburg, Russia*)
Development of Intelligent Control Architecture for Multi-Tracking Surveillance Systems
9527. **M.S. Plekhanov, M.V. Konash, E.V. Babaev, A.A. Dzuev** (*JSC "Inertial Technologies of Technocomplex", Ramenskoe, Moscow Region, Russia*)
A Research of Measurement Transforms Model of the MEMS-Module Accelerometer Channel for a Wheel Sensor
8428. **S.P. Simakov, I.V. Belokonov** (*Samara University, Russia*)
Algorithm for Determining the Spatial Orientation of a Noncooperative Space Object Based on Processing of a Sequence of Stereo Images

15.25 – 15.30

DISCUSSION OF THE POSTER PAPERS

15.30 – 16.00

COFFEE BREAK

PLENARY PAPERS

- 16.00 – 16.20 29. **A.B. Tarasenko** (*Moscow Institute of Physics and Technology, Dolgoprudny, **Russia***),
68 **A.B. Kolchev** (*JSC "LASEX", Dolgoprudny, **Russia***),
 E.A. Milikov, P.V. Larionov, A.A. Fomichev,
 P.A. Filatov (*Moscow Institute of Physics and Technology, JSC "LASEX", Dolgoprudny, **Russia***), Development, Tuning and Testing of a New Small-Sized Integrated Navigation System
- 16.20 – 16.40 30. **Z.Y. Lu** (*Naval Research Academy, Beijing, **China***),
14 **Y.W. Zhao, L.X. Wang, M.Y. Wang** (*Tianjin Navigation Instrument Research Institute, **China***)
Research on Axis Misalignment Auto-Calibration of Rotary INS/CNS Integrated System
- 16.40 – 17.00 31. **B.S. Aleshin, A.I. Chernomorsky, E.D. Kuris,**
30 **K.S. Lelkov, V.A. Petruhin, V.V. Miheev, T.S. Khorev**
 (*Moscow Aviation Institute, **Russia***)
Ground Uniaxial Wheel Modules for Transportation and Angular Orientation Control of Environmental Monitoring Equipment
- 17.00 – 17.20 32. **Benjamin Tennstedt, Steffen Schön** (*Institut für Erdmessung, Leibniz Universität Hannover, Hannover, **Germany***)
97 Integration of Atom Interferometers and Inertial Measurement Units to Improve Navigation Performance
- 17.20 – 17.40 33. **R.R. Bikmaev** (*Institute of Engineering Physics, Serpukhov, **Russia***)
32 Error Estimation of a Strapdown Inertial Navigation System Based on the Results of Road Sign Recognition in a Multidimensional Optical Geophysical Field

TUESDAY, 1 JUNE

- 11.20– 11.40 38. **X. Hu, W. Hong, P. Zhang, H. Chen, W. Jiang,**
15 **B. Huang, S. Lou** (*Institute of Systems Optimization, Xi'an
Aerospace Precision Electromechanical Institute, Xi'an,
China*)
Reduction of the Shupe Effect in Fiber Coil Based on Turn
Number Optimization

POSTER PAPERS¹

- 11.40 – 12.40 39. **L.N. Belsky, L.V. Vodicheva, Yu.V. Parysheva**
 (*JSC Academician N.A. Semikhatov Scientific and
64. Production Association of Automatics, Yekaterinburg,
Russia*)
Estimation of Generic Parameters in a Technique for Initial
Alignment and Calibration of INS for Space Launch
Vehicles
6040. **V.A. Smirnov, A.V. Prohortsov, A.E. Soloviev** (*Tula
State University, Tula, Russia*)
A Calibration Method for Medium-Accuracy Strapdown
INS
241. **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
7842. **G.O. Barantsev, A.A. Golovan, A.I. Matasov**
 (*Lomonosov Moscow State University, Moscow, Russia*),
P.V. Alyunov, A.Yu. Mishin, D.M. Fomin (*JSC ASPE
"TEMP-AVIA", Arzamas, Russia*)
Test Bench Calibration of an Accelerometer Unit in the
Conditions when Scale Factor Errors Depend on the Sign
of the Input Signal
10243. **S.Yu. Perepelkina, A.A. Fedotov** (*JSC Academician
N.A. Semikhatov Scientific and Production Association
of Automatics, Yekaterinburg, Russia*)
Determination of Permissible Levels for Frequency
Characteristics of SINS Measuring Channels

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1844. **Yuyang He, Gongmin Yan, Yu Deng** (*School of Automation, Northwestern Polytechnical University, Xi'an, China*)
Research on Initial Alignment Technology of Revolution Modulation SINS
10145. **V.V. Avrutov, O.I. Nesterenko** (*Kiev Polytechnic Institute, Kiev, Ukraine*)
A Method for Autonomous Determination of a Vehicle's Latitude and Longitude
2646. **A.V. Chernodarov, A.P. Patrikeev, P.S. Gorshkov** (*NaukaSoft Experimental Laboratory, Ltd. , Moscow, Russia*)
Adaptive Robust Processing of Inertial Sensor Signals
2147. **Ye Tian, Nan Li, Gongmin Yan, Zhongshuai Yu** (*School of Automation, Northwestern Polytechnical University, Xi'an, China*)
Initial Alignment of Shaking Base Based on Parameter Identification Method While the Latitude is Unknown
8748. **D.A. Burov** (*VNII Signal JSC, Kovrov, Russia*)
Accuracy Estimation of Azimuth Determination by Ring Laser Gyroscopes: Discussion of the Results
7149. **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", Saint Petersburg, Russia*)
Specific Features of Using Micromechanical Accelerometers for Monitoring Short and Impact Irregularities of the Railway Track
1950. **Kun Wei, Xu Li, Xiang Xi Liu** (*School of Instrument Science and Engineering Southeast University, Nanjing, China*)
A Reliable Fault-Tolerant Estimation Method of Roll State for Tank Semi-trailer Based on Inertial Measurement

6151. **Nourhan Abdelrahman, Anastasiia Annenkova, Dmitry Pritykin** (*Skolkovo Institute of Science and Technology, Moscow, Russia*), **Danil Ivanov** (*Keldysh Institute of Applied Mathematics, Moscow, Russia*)
A Nanosatellite Magnetic Attitude Control System and Residual Magnetization: Design, Laboratory Tests, and In-Orbit Identification
5952. **A.V. Prohortsov, V.A. Smirnov** (*Tula State University, Tula, Russia*), **M.A. Prohortsova** (*schoolchild, Tula, Russia*)
Human Respiration Measurement System
1753. **D.Y. Gao, B.Q. Hu, L.B. Chang, F.J. Qin, A. Li** (*Department of Navigation Naval University of Engineering, Wuhan, China*)
A Real Time Gravity Compensation Method for High Precision INS Based on Neural Network
5854. **O.A. Stepanov, A.V. Motorin** (*Concern CSRI Elektropribor, JSC, ITMO University, Saint Petersburg, Russia*), **A.A. Krasnov, A.V. Sokolov** (*Concern CSRI Elektropribor, JSC, Saint Petersburg, Russia*), **R.U. Titov** (*ITMO University, Saint Petersburg, Russia*)
Identification of the Model Parameters for the Damped Gravimeter Sensitive Element
5655. **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
1356. **Da Li, Wei Wang** (*Tianjin Navigation Instrument Research Institute, China*), **Zhong Li** (*Tianjin Navigation Instrument Research Institute, Laboratory of Science and Technology on Marine Navigation and Control of China State Shipbuilding Corporation, Tianjin, China*), **Cheng-suo Li** (*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

4557. **A.G. Kuznetsov, V.I. Galkin, D.N. Vorob'ev**
(*PJSC "MIEA"(Moscow Institute of Electromechanics and
Automatics), Moscow, Russia*)

Ways to Improve the Accuracy of Gyroscopic Devices on
Micromechanical Sensors of Flight Control Systems

558. **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

12.40– 13.00

DISCUSSION OF THE POSTER PAPERS

13.00 – 14.00

LUNCH

PLENARY PAPERS

14.00 – 14.20 59. **Yu.Yu. Broslavets, A.A. Fomichev,**
72 **D.M. Ambartsumyan, E.A. Polukeev, V.G. Semenov**
(*Moscow Institute of Physics and Technology, JSC LASEX,
Dolgoprudny, Russia*)
Multifrequency Solid-State Laser Gyroscope on YAG:Cr4+

14.20 – 14.40 60. **Yu.Yu. Broslavets, P.V. Larionov, E.A. Milikov,**
69/75 **A.D. Morozov, E.A. Polukeev, V.G. Semenov,**
A.B. Tarasenko, P.A. Filatov, A.A. Fomichev
(*Moscow Institute of Physics and Technology, JSC LASEX,
Dolgoprudny, Russia*)
New Four-Frequency Zeeman Laser Gyroscope with a
Nonplanar Symmetric Cavity, Its Parameters and Operation
Features

POSTER PAPERS¹

14.40 – 15.25 61. **D.S. Smirnov, I.G. Deyneka , A.V. Kulikov,**
103 **V.E. Strigalev, I.K. Meshkovskiy** (*ITMO University,
Saint Petersburg, Russia*)
Methods for Studying Temperature Characteristics
of a FOG Sensing Element

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862. **E.A. Petrukhin** (*JSC “Serpukhov Plant “Metallist”, Serpukhov, Russia*), **A.S. Bessonov** (*MIREA - Russian Technological University, Moscow, Russia*)
Dissipative and Conservative Backscattering in Ring Laser Gyro Cavity
363. **Hakan Keskin** (*Roketsan and METU, Ankara, Turkey*), **Hüseyin Avni Vural** (*Roketsan, Ankara, Turkey*), **Ece Alaçakır Demir** (*Roketsan, Ankara, Turkey*), **Hakan Altan** (*METU, Ankara, Turkey*)
The Evaluation of Various Designs for Ytterbium Doped Fiber Based Superfluorescent Source at 1 μ m Wavelength
2964. **G.O. Barantsev, A.V. Kozlov** (*Lomonosov Moscow State University, Moscow, 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
7465. **P.A. Filatov, A.B. Tarasenko, V.G. Semenov** (*Moscow Institute of Physics and Technology, Moscow, Russia*), **A.A. Fomichev, E.A. Milikov** (*Moscow Institute of Physics and Technology, JSC “LASEX”, Moscow, Dolgoprudny, Russia*), **A.I. Varenik, A.D. Morozov** (*JSC LASEX, Dolgoprudny, Russia*)
Studying the Accuracy Characteristics of Q-flex Accelerometers for Modernization of SINS
6666. **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
967. **V.Ya. Raspopov, R.V. Alaluev, V.V. Likhosherst** (*Tula State University, Russia*), **S.I. Shepilov** (*JSC Michurinsky Progress plant, Michurinsk, Russia*)
Gyrostabilizer with an Increased Rate of Controlled Precession Based on a Gyroscope with a Spherical Ball Bearing Suspension

9368. **P.K. Plotnikov** (*Yury Gagarin State Technical University of Saratov, **Russia***)
Study of the Effect due to Implementation in a Three-Component Gyroscopic Angular Velocity Meter, Based on the Kovalevskaya Gyroscope, a Computer Model of Its Translational Motion and Negative Electromechanical Feedbacks by Their Signals
8869. **A.N. Korolev, E.D. Bokhman, P.A. Pavlov, P.A. Ivanov, Yu.V. Filatov** (*Saint Petersburg State Electrotechnical University “LETI”, Saint Petersburg, **Russia***), **A.Ya. Lukin** (*Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, **Russia***)
Development of Digital Angle Measuring Technologies Based on the Use of Two-Dimensional Scales for Metrological Support of Navigation Systems
4170. **M.X. Xing** (*Beijing Institute of Aerospace Control Devices, Beijing, **China***), **G. Toker** (*AMSYS Ltd, Tel Aviv Yafo, **Israel***), **V. Sobolev** (*VIZOR Ltd, Tel Aviv Yafo, **Israel***)
Improvement of Accuracy of Angle Encoders by Calibration
2471. **V.M. Nikiforov, A.S. Anokhin, A.D. Vorona, B.D. Chernyshev, A.A. Gusev, K.A. Andreev, A.A. Nizhegorodov** (*Academician Pilyugin Scientific-Production Center of Automatics and Instrument-Making, Moscow, **Russia***)
Computer-Aided Synthesis of a Pendulum Accelerometer Correction Circuit
9072. **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 Zeeman Gyros
1073. **A.A. Maslov, D.A. Maslov, I.V. Merkuriev, V.V. Podalkov** (*National Research University “Moscow Power Engineering Institute”, Moscow, **Russia***)
The Impact of Nonlinearity and Frequency Difference on the Drift of the Solid-State Wave Gyroscope in the Angular Velocity Sensor Mode

9274. **M.A. Basarab, I.P. Ivanov** (*Bauman Moscow State Technical University, Moscow, **Russia***), **B.S. Lunin** (*Lomonosov Moscow State University, Moscow, **Russia***)
Parameter Estimation of the Solid-State Wave Gyroscope on the Basis of the Neural Network Autoregression Algorithm for Time Series Prognosis
- 15.25 – 15.30 **DISCUSSION OF THE POSTER PAPERS**
- 15.30 – 16.00 COFFEE BREAK
- 16.00 **PANEL DISCUSSION: Satellite navigation systems**

WEDNESDAY, 2 JUNE

SESSION III – MOTION CONTROL

INVITED PAPER

- 10.00 – 10.45 5. **G.P. Anshakov** (*Joint Stock Company Space Rocket Centre Progress, Samara, **Russia***), **M.Yu. Belyaev** (*S. P. Korolev Rocket and Space Corporation Energia, Korolev, **Russia***), **V.A. Kapitonov** (*Joint Stock Company Space Rocket Centre Progress, Samara, **Russia***)
Evolution of Launch Vehicles: From Vostok to Soyuz-2. From the First Man-in-Space Flight to the Permanent Manned Orbital Station.

PLENARY PAPER

- 10.45 – 11.05 6. **E.A. Sergaeva, O.L. Starinova** (*Samara University, **Russia***)
70
Motion Control of a Spacecraft with Low-Thrust Engines for a Flight to a Near-Earth Asteroid

POSTER PAPERS¹

- 11.05 – 11.35 7. **I.V. Belokonov, M.S. Shcherbakov** (*Samara University, Samara, Russia*)
83
Development of a Single-Axis Control Law Based on SDRE-Technology for Inspection Motion of Two Nanosatellites
338. **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
869. **A.S. Samokhin** (*Lomonosov Moscow State University, V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, Russia*), **M.A. Samokhina** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, Russia*)
Estimation of a Possible Gain from the Perturbation Maneuver Near the Moon in the Simulation of a Flight to Mars Based on the Solutions to Lambert's Problems
490. **A.V. Nebylov** (*State University of Aerospace Instrumentation, Saint Petersburg, Russia*), **V.A. Nebylov** (*International Institute for Advanced Aerospace Technologies, State University of Aerospace Instrumentation, Saint Petersburg, Russia*)
Modern Problems of WIG Craft Navigation and Flight Control
801. **A.V. Nebylov, V.V. Perlyuk** (*State University of Aerospace Instrumentation, Saint Petersburg, Russia*), **Yang Xiao HU** (*Shenyang Ligong University, Shenyang, China*)
Development of an Integrated System of Onboard Equipment to Provide Trajectory Control of a Small Unmanned Aerial Vehicle
542. **E.V. Barinova, I.V. Belokonov, I.A. Timbai** (*Samara National Research University, Samara, Russia*)
Study of Resonant Motion Modes of a CubeSat Nanosatellite with Small Inertia-Mass Asymmetry under the Aerodynamic Moment

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473. **D.G. Kostrygin, A.M. Popov** (*Baltic State Technical University "Voenmeh" named after D.F. Ustinov, Saint Petersburg, Russia*)
Algorithms for UAV Flight Control along a Given Path Based on Guiding Vector Fields
44. **Ye.I. Somov, S.A. Butyrin, S.E. Somov** (*Samara State Technical University, Russia*)
Guidance and Control of a Space Robot at Additional Launching and Approaching an Information Geostationary Satellite
445. **D.E. Gutsevich, K.D. Chekhovskaya, D.Yu. Livshits, I.K. Kuzmenko** (*SC DBIA, Saratov, Russia*)
Development of a Stabilization System for Single-Track Vehicles by the Example of a Bicycle

11.35 – 11.40

DISCUSSION OF THE POSTER PAPERS

11.40 – 12.10

COFFEE BREAK

12.10 – 13.00

**PANEL DISCUSSION:
Motion Control of Moving Objects**

Reports:

A.V. Nebylov (*Saint Petersburg State University of Aerospace Instrumentation, Saint Petersburg, Russia*)
Studying a Maximum Error in Solving Motion Control Problems

M.N. Krasil'schikov, D.A. Kozorez, D.M. Kruzhkov (*Moscow Aviation Institute (National Research University), Moscow, Russia*)
Solving Navigation and Control Problems when Putting a Payload in the Geostationary Orbit Based on Modern and Advanced GNSS Information Technologies

13.00 – 14.00

LUNCH

**PANEL DISCUSSION:
Motion Control of Moving Objects
(c o n t i n u e d)**

Reports: **Mengyin Fu** (*Nanjing University of Science and Technology, China*)

The title is to be updated.

M.Yu. Ovchinnikov (*Keldysh Institute of Applied Mathematics, Moscow, Russia*)

Problems of Motion Control and Navigation of Small Spacecraft in Interplanetary Missions

DISCUSSION

15.30 – 16.00 COFFEE BREAK

SESSION IV – RELEVANT ISSUES OF THEORY

PLENARY PAPER

16.00 – 16.20 86. **Yangwei Ou, Yuanxin Wu** (*Shanghai Jiao Tong University, Shanghai, China*)
6 Inertial Navigation by Trident Quaternion

POSTER PAPERS¹

16.20 – 16.50 87. **Yu.N. Chelnokov, M.Yu. Loginov** (*Institute of Precision Mechanics and Control of RAS, Saratov, Russia*)
46 New Quaternion Models of Spaceflight Regular Mechanics and their Applications in the Problems of Motion Prediction for Space Bodies and in Inertial Navigation in Space

188. **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 a Strapdown INS on a Fixed Base Using Tikhonov Regularization

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9689. **P.K. Plotnikov, A.P. Plotnikov** (*Yury Gagarin State Technical University of Saratov, **Russia***)
Analysis of Motion Equations and Some Properties of the Corrected Strapdown Computer-Aided Gyro
6790. **S.E. Perelyaev** (*Ishlinsky Institute for Problems in Mechanics of RAS, Moscow, **Russia***)
Theory of the Van der Pol Two-Degree-of-Freedom Oscillator and Its Technical Applications to Modern Solid-State Wave Gyros
8291. **D.A. Koshaev** (*Concern CSRI Elektropribor, JSC, ITMO University, Saint Petersburg, **Russia***)
Generation of Smoothing Spline for On-Line Estimation of a Maneuvering Vehicle Trajectory
5592. **D.A. Bedin, A.G. Ivanov** (*N.N. Krasovskii Institute of Mathematics and Mechanics (IMM UB RAS), Yekaterinburg, **Russia***)
Multicriteria Optimization of the Trajectory Tracking Filtering Procedure by Genetic Algorithm
8593. **A.A. Galyaev, M.A. Samokhina** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, **Russia***),
A.S. Samokhin (*V.A. Trapeznikov Institute of Control Sciences of RAS, Lomonosov Moscow State University, Moscow, **Russia***)
Application of the Gradient Projection Method to the Problem of Detectors Arrangement for Counteraction to the Evasive Object
8194. **O.S. Amosov, S.G. Amosova** (*V.A. Trapeznikov Institute of Control Sciences of RAS, Moscow, **Russia***)
Adaptive Estimation of the Processes with Disorders in Navigation Applications Using Machine Learning
7795. **M.A. Barulina, D.V. Kondratov, S.A. Galkina, O.V. Markelova** (*Institute of Precision Mechanics and Control of RAS, Saratov, **Russia***)
Numerical and Analytical Modeling of Nanoscale Inertial-Sensor Elements Motion

- 6596. I.V. Papkova, A.V. Krysko, V.A. Krysko** (*Yuri Gagarin State Technical University of Saratov, Russia*)
A General Theory of NEMS Resonators in the Form of Nanobeams and Nanoplates

16.50 – 17.00

DISCUSSION OF THE POSTER PAPERS

17.00– 17.15

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