International Federation of Automatic Control

IFAC Workshop
Aerospace Guidance, Navigation and Flight Control Systems
AGNFCS' 09

FINAL PROGRAM

June 30 – July 2, 2009
Samara, Russia

Sponsors
IFAC Technical Committee on Automatic Control in Aerospace
Co-sponsors
IFAC Technical Committee on Non-Linear Control Systems
Russian National Committee on Automatic Control (RNKAU)
Division on EMMCP of Russian Academy of Sciences (RAS)
Russian Foundation on Basic Research (RFBR), Grant 09-08-06038
International Physics and Control Society (IPACS)
Intern. Public Association "Academy of Navigation and Motion Control"
State Research - Production Rocket-Space Center "TsSKB-Progress"
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Government of Samara Region

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IFAC Workshop AGNFCS' 09

The Workshop Registration Desk is open on
Monday,   June 29, 2009: 16:00 – 19:00
Tuesday,   June 30, 2009:   9:00 – 19:00
Wednesday,   July 1, 2009:   9:00 – 14:00
Thursday,   July 2, 2009,   9:00 – 14:00

The **Workshop Schedule**

MONDAY, June 29
19:00 – 21:00   Welcome Reception

TUESDAY, June 30
10:00 – 12:00   **Opening Ceremony. Plenary Session TuPL1**
12:00 – 12:40   Coffee Break
12:40 – 14:00   **Plenary Session TuPL2**
14:00 – 15:00   Lunch
15:00 – 16:40   **Regular Sessions TuS, TuA**
16:40 – 17:00   Coffee Break
17:00 –18:00   **Regular Sessions TuS, TuA**
18:00 –19:00   **Poster Session TuP**
20:00 –22:00   The Workshop Banquet

WEDNESDAY, July 1
10:00 –10:40   **Plenary Session WePL1**
10:40 –11:40   **Regular Sessions WeG, WeV**
11:40 –12:00   Coffee Break
12:00 –12:40   **Regular Sessions WeG, WeV**
12:40 – 14:00   **Poster Session WeP**
14:00 – 15:00   Lunch
15:00 – 17:00   **Technical Visit "Space & Samara"**
17:00 – 20:30   **Boat trip on the Volga river**

THURSDAY, July 2
10:00 – 12:00   **Plenary Session ThPL1**
12:00 – 12:30   Coffee Break
12:30 – 13:10   **Plenary Session ThPL2**
13:10 – 13.50   **Panel Discussion**
13.50 – 14:00   **Closing Ceremony**
14:00 – 15:00   Lunch
15:00 –18:00   Sightseeing Tours
18:00 – 20:00   Closing Reception

Scope of the Workshop covers all areas of the guidance, navigation and flight control systems' theory and its practical applications in aerospace engineering.

Topics of the Workshop include

- **Aircraft guidance, navigation and flight control**
- **Launcher & Missile guidance and flight control**
- **Spacecraft guidance, navigation and flight control**
- **High accuracy pointing in aerospace engineering**
- **In-flight calibration of the spacecraft onboard systems**
- **Nonlinear dynamics of flight control systems**
- **Onboard control algorithms implementation**

The official language of the Workshop is English.

Conference Venue
The Conference will be held at the "Scientist House "
(the SSC RAS building, "Dom Uchenykh" in Russian)
3 a Studenchesky Lane, 443001, Samara, RUSSIA
Phone: +7(846) 337 53 81   Fax: +7(846) 337 82 79

Registration Desk
The participants are invited to pick up their Conference bag at the registration desk. The registration desk will be open for registration matters and other information during the following hours:
Monday,   June 29, 2009: 16:00 – 19:00
Tuesday,   June 30, 2009:   9:00 – 19:00
Wednesday, July 1, 2009:   9:00 – 14:00
Thursday,   July 2, 2009,   9:00 – 14:00

Publications
Preprints of the Workshop on CD-ROM and the Program will be distributed to the participants at the Registration desk.
After the Conference the Proceedings will be published online on IFAC dedicated website - **PapersOnLine.net** - an on-line archive with free access to all.

All papers actually presented at the Workshop are going to be posted on the site in PDF format - searchable and citable via the existing IFAC Proceedings ISSN and Digital Object Identifiers (DOIs) - the latest industry standard for citing digital publications.

Accommodation
Most participants will be staying at the Rossiya hotel.

Internet Access and Computer/CD-ROM Facilities
Free Internet access and computer/CD-ROM facilities are provided to participants from June 29 through July 2 at the Registration desk.

Meals
Lunch coupons are available at the registration desk.

Conference Banquet
The Conference Banquet takes place on **Tuesday, June 30** at 20:00 at restaurant on Volga bank nearby the Rossiya hotel.

Social Program
Samara with its about 1.5 million inhabitants is one of the most beautiful cities in Russia. Guided tours of Samara and suburbs, a trip down the Volga River to the Zhiguli Mountains, and visits to the city museums are organized during both the Workshop days and the weekend.
The Workshop is held in the Scientists' House (the SSC RAS building) located at the Volga riverfront nearby the city historical center.

Sightseeing Tours
A number of sightseeing tours are organized for the Workshop participants and accompanying persons.
Individual tours are available upon request at the Registration desk.

Currency
Currency exchange services are offered in any bank and in most hotels. The most popular currencies are US dollar and Euro. Credit cards and travel checks are accepted in some banks. However, the commission rates are rather high (5-10%). Therefore cash is still preferable way of payment in Russia.

Electricity
The electricity is supplied at 220V, 50 Hz in Russia.

Responsibility
The organizers do not accept responsibility for any personal injury, damage or loss of property, which may occur in connection with this Conference.
All participants are advised to arrange travel insurance before departure from theirs home countries.

T E C H N I C A L P R O G R A M

Tuesday, June 30, 10:00 – 12:00
Main Hall

The Opening Ceremony. Plenary Session TuPL1
Chair: A.B. Kurzhanski (Russia)

10:40 – 11:20
TuPL-1 The SRP RSC "TsSKB-Progress": Trends and Future Prospects
A.N. Kirilin, R.N. Akhmetov, S.I. Tkachenko
(State Research - Production Rocket-Space Center "TsSKB-Progress", Russia)

11:20 – 12:00
TuPL-2 Autonomous Attitude Reference System for Remote Sensing Satellites
G.P. Anshakov *(State Research - Production Rocket-Space Center "TsSKB-Progress", Russia)*
V.G. Peshekhonov, B.E. Landau, L.P. Nesenyuk
(Central Scientific Research Institute "Electropribor", Russia)

12:00 – 12:40   **Coffee Break**

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Tuesday, June 30, 12:40 – 14:00
Main Hall

Plenary Session TuPL2
Chair: H. Siguerdidjane (France)

12:40 – 13:20
TuPL-3 Networked Distributed Pico-Satellite Systems for Earth Observation and Telecommunication Applications
K. Shcilling
(Julius-Maximilians University, Germany)

13:20 – 14:00
TuPL-4
Nonlinear Dynamics of the Spacecraft Gyromoment Control System with Plasma Thrusters at Initial Modes
V.A. Rayevsky, G.P. Titov, Ye.N. Yakimov *(ISS Reshetnev, Russia)*,
Ye. I. Somov *(Samara Scientific Center, Russian Academy of Sciences, Russia)*

14:00 – 15:00 **Lunch**

Session "SPACECRAFT" TuS1
Co-Chairs: G. Bertoni (Italy), G. Titov (Russia)

15:00 – 15:20
TuS-1 Autonomous Tracking System for Carrier Rocket Orbital Stage Motion: Structure and Algorithms
I.V. Belokonov, A. V. Kramlikh *(Korolev Samara State Aerospace University, Russia)*

15:20 – 15:40
TuS-2 Mixed Extended Backstepping - Sliding Modes Control with off line Parameter Optimization used for a Class of Solenoid Actuators
C. Teodorescu, H. Siguerdidjane, A. Arzande *(Supelec, France)*
 F. Dugue *(CSTM, France)*

15:40 – 16:00
TuS-3 Robust Model Predictive Control for Spacecraft Rendezvous with Online Prediction of Disturbance Bounds
F. Gavilan, R. Vazquez, E. Camacho *(Sevilla University, Spain)*

16:00 – 16:20
TuS-4 Mathematical Models of Complex Flexible Missile and Software for Control System Design and Simulation
A.I. Panferov, S.A. Brodsky, A.V. Nebylov
(International Institute for Advanced Aerospace Technologies,
Saint Petersburg State University of Aerospace Instrumentation, Russia)

16:20 – 16:40
TuS-5 Bisection Method for CMG Steering Logic in Satellite Attitude Control
M. N. Demenkov *(De Montfort University, UK)*
E. N. Kryuchenkov *(Moscow Institute of Radio-engineering, Electronics and Automation, Russia)*

16:40 – 17:00   **Coffee Break**

Session "AIRCRAFT" TuA1
Co-Chairs: P. Castaldi (Italy), A.V. Nebylov (Russia)

15:00 – 15:20
TuA-1 New Generation of Automatic Control Systems for WIG-craft
A.V. Nebylov *(International Institute for Advanced Aerospace Technologies, Saint Petersburg State University of Aerospace Instrumentation, Russia)*

15:20 – 15:40
TuA-2 Nonlinear Control of a Airbreathing Hypersonic Vehicle: a Backstepping Approach
F. Poulain, H. Piet-Lahanier, L. Serre *(ONERA, France)*

15:40 – 16:00
TuA-3 PID Adaptive Control Design Based on Singular Perturbation Technique: a Flight Control Example
V. D. Yurkevich *(Novosibirsk State Technical University, Russia)*

16:00 – 16:20
TuA-4 Velocity Vector Roll Control of a Fighter Aircraft with Multi-axis Thrust Vectoring Controls
O. Atesoglu (*Aselsan Inc., Turkey*)
M. K. Ozgoren (*Middle East Technical University, Turkey*)

16:20 – 16:40
TuA-5 Conflict Detection and Resolution in Air Traffic Control
S.I. Kumkov *(Institute of Mathematics and Mechanics, Ural Branch, Russian Academy of Science, Russia)*

16:40 – 17:00 **Coffee Break**

Session "SPACECRAFT" TuS2
Co-Chairs: Yo. Ochi (Japan), Ye. I. Somov (Russia)

17:00 – 17:20
TuS-6 In-flight Alignment Calibration of a Space Telescope with a Star Tracker Cluster
Ye. I. Somov, S.A. Butyrin *(Samara Scientific Center, Russian Academy of Sciences, Russia)*

17:20 – 17:40
TuS-7 Kalman Filtering in the Theory of Gyroscopic Systems
E.Ya. Gorelova, V.A. Sobolev *(Samara State University, Samara Scientific Center, Russian Academy of Sciences, Russia)*

17:40 – 18:00
TuS-8 Simulation of the Control Processes of the Automatic Spacecraft for Observation in the Regimes of the Target Functioning
V.I. Kurenkov, V.V. Salmin, A.S. Kucherov *(Korolev Samara State Aerospace University, Russia)*

Session "AIRCRAFT" TuA2
Co-Chairs: P. Castaldi (Italy), A. Barabanov (Russia)

17:00 – 17:20
TuA-6 Bounded-error Identification of the Effect of Wind Gusts on a Small-scaled Helicopter
W. Achour, H. Piet – Lahanier *(ONERA, France),*
H. Siguerdidjane *(Supelec, France)*

17:20 – 17:40
TuA-7 Design of Helicopter Autopilot
A.E. Barabanov, D.V. Romayev
(Saint Petersburg State University, Russia)

17:40 – 18:00
TuA-8 Dynamics and Control of Autogiro Rotor with Flexible Hub
O. Polyntsev *(Schlumberger , UK)*
Ye.I. Somov *(Samara Scientific Center, Russian Academy of Sciences, Russia)*

Poster Session TuP

TuP-1
Control System of the Arial Vehicle with Kalman Filter using the Neural Network for Adjustment of its Parameters
V.M. Ponyatskiy *(Instrument Design Bureau, Tula State University, Russia)*

TuP-2 Algorithms for Command Control of Hypersonic Aircraft at the Climbing Leg
V.L. Balakin, A.G. Kochyan *(Korolev Samara State Aerospace University, Russia)*

TuP-3 Spacecraft Attitude Control with Precise Pointing the Flexible Antennas
Ye.I. Somov *(Samara Scientific Center, Russian Academy of Sciences, Russia)*
G.P. Titov, Ye.N. Yakimov *(ISS Reshetnev, Russia)*

TuP-4 Analytical Synthesis of Precise Control Algorithms for a Space Purpose Object
S.D. Zemlyakov, V.M. Glumov and D.A. Krivoruchko
(Institute of Control Science, Russian Academy of Sciences, Russia)

TuP-5 Realization of Variable Structure System for Astatic Aircraft Control
A.S. Syrov, A.M. Puchkov *(MOKB "MARS", Russia)*
S.D. Zemlyakov, V.M. Glumov
(Institute of Control Science, Russian Academy of Sciences, Russia)

TuP-6 Robust Stability of Nonlinear Gyromoment Orientation System of Flexible Spacecraft
V.Yu. Rutkovsky, V.M. Sukhanov, I.N. Krutova
(Institute of Control Science, Russian Academy of Sciences, Russia)

TuP-7 Technique for Design of High-Quality Flight Control System
V.G. Borisov. A.M. Shevchenko
(Institute of Control Science, Russian Academy of Sciences, Russia)

TuP-8 Features of Informational Control Complex of Autonomous Spacecraft
D. A. Goldin, A. M. Chesnokov
(Institute of Control Science, Russian Academy of Sciences, Russia)

TuP-9 LMI Optimization of Sensors System for Elastic Vehicle Control Design Based on the Quadratic Performance Index
S. A. Brodsky, A. V. Nebylov, A. I. Panferov
(International Institute for Advanced Aerospace Technologies, Saint Petersburg State University of Aerospace Instrumentation, Russia)

TuP-10 Problem of Space Vehicle's Orbital Motions Control Using Low-Thrust
A. A. Kolesnikov (*Technological Institute of Southern Federal University, Russia*)

TuP-11 Spatial motion interrelated control system dynamics: fundamental and modified control laws
A. A. Kolesnikov, A. S. Mushenko (*Technological Institute of Southern Federal University, Russia*)

TuP-12 Synergetics control of aircraft's actuators
G. E. Veselov (*Technological Institute of Southern Federal University, Russia*)

TuP-13 Pulse -Width Control of a Flexible Spacecraft
S.Ye. Somov *(Samara Scientific Center, Russian Academy of Sciences, Russia)*

TuP-14 Dynamics of Spacecraft Guidance and Spin-up of the Gyrodine's Rotors at Pulse-Width Control
S.Ye. Somov *(Samara Scientific Center, Russian Academy of Sciences, Russia)*

TuP-15 Nonlinear Dynamics and Robust Control of an Autogiro Rotor
O. Polyntsev *(Schlumberger , UK)*
Ye.I. Somov *(Samara Scientific Center, Russian Academy of Sciences, Russia)*

TuP-16 Optimizing the Spacecraft Guidance Laws at the Earth Optoelectronic Observation
Ye. I. Somov, S.A. Butyrin, A.V. Butko
(Samara Scientific Center, Russian Academy of Sciences, Russia)

TuP-17 Creation of Algorithms for Correction of Low-altitude Orbit Parameters for a Space Vehicle with Electrical Rocket Propulsion System
V.V. Salmin, V.V. Volotsuev, S. I. Tkachenko
(Korolev Samara State Aerospace University, Russia)

TuP-18 Navigation, Control and High-Precision Guidance System for Moving Objects Providing Prompt Terrain Modeling by use of Aerial and Satellite Images
A. Alchinov, N. Beklemishev, V. Kekelidze, V. Kostin
(Institute of Control Science, Russian Academy of Sciences, Russia)

TuP-19 Robust Decentralized Control of Interconnected Uncertain Systems with Scalar Input-output
E.A. Parsheva *(Astrakhan State Technical University, Russia)*

TuP-20 Orbital Tether System Parameters Identification for Small Subsatellites Deorbiting from Circular and Elliptic Orbit
S.A. Ishkov, I. V. Sheynikov
(Korolev Samara State Aerospace University, Russia)

TuP-21 Diagnosis and Reconfiguration of the Spacecraft Fault Tolerant Gyromoment Control Systems
Ye.I. Somov, V.P. Makarov *(Samara Scientific Center, Russian Academy of Sciences, Russia)*
V.M. Matrosov *(Stability and Nonlinear Dynamics Research Center, Mechanical Engineering Research Institute, Russian Academy of Sciences. Russia)*

TuP-22 Optimization of Motion of a Space Vehicle with Low Thrust in a System Earth – Moon
O.L. Starinova *(Korolev Samara State Aerospace University, Russia)*

TuP-23 The Numerical Method of Control Forming for Aerospace Vehicle Trajectory
Yu. N. Lasarev *(Samara Scientific Center, Russian Academy of Sciences, Russia)*

TuP-24 Attitude Control Systems for the Communication Spacecraft
V.A. Rayevsky *(ISS Reshetnev, Russia)*
Ye.I. Somov *(Samara Scientific Center, Russian Academy of Sciences, Russia)*

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Wednesday, July 1, 10:00 – 10:40
Main Hall

Plenary Session WePL
Chair: H. Siguerdidjane (France)

10:00 – 10:40
WePL-1 Problematic Points regarding Autonomous Functional Control of Low-orbit Remote Sensing Satellites
R.N. Akhmetov
(State Research - Production Rocket-Space Center "TsSKB-Progress", Russia)

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Session "GUIDANCE and NAVIGATION"   WeG1
Co-Chairs: R. Vazquez (Spain), Ye. Somov (Russia)

10:40 – 11:00
WeG-1 Monitoring and   Multilevel Protection of the Integrity of Tightly – Coupled Navigation Systems for Maneuverable   Aircraft
A.V. Chernodarov *(Zhukovsky Air Force Engineering Academy, Russia)*

11:00 – 11:20
WeG-2 Efficient Divided Difference Filters Applied to Low Accuracy Inertial Navigation System
A. Ouldali *(Military Polytechnic School, Algeria)*
H. Benzerrouk *(Saad Dahlab University of Blida, Algeria)*

11:20 – 11:40
WeG-3 GEO Satellite Image Navigation with Cloud Detection using Multispectral Payload Image Data
E. Zaunick, K. Janschek, J. Levenhagen
(Dresden Technical University, Germany)

11:40 – 12:00   **Coffee Break**

Session "VEHICLE CONTROL" WeV1
Co-Chairs: P. Castaldi (Italy), S. Kumkov (Russia)

10:40 – 11:00
WeV-1 Planning and Control of Spatial Motions of Flying Vehicle
A. P. Krishchenko, A. N. Kanatnikov, S. B. Tkachev
(Bauman Moscow State Technical University, Russia)

11:00 – 11:20
WeV-2 Systems's Law of Gravity Interaction and the Problem
of Aerospace Systems Accuracy Increasing
A.A. Kolesnikov
(*Technological Institute of Southern Federal University, Russia*)

11:20 – 11:40
WeV-3 Aircraft Motion Estimation under Conditions of Uncertainty
S. I. Kumkov *(Institute of Mathematics and Mechanics, Ural Branch,*
Russian Academy of Science, Russia)
S. G. Pyatko (State Scientific Research Institute for Aero-navigation,
Russia)

11:40 – 12:00   **Coffee Break**

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Session "GUIDANCE and NAVIGATION"   WeG2
Co-Chairs: K. Schilling (Germany), Ye. Somov (Russia)

12:00 – 12:20
WeG-4 Iterative Methods for Ballistic Schemes Optimization of
Interplanetary Missions with Low Thrust
V.V. Salmin, O.L. Starinova, K.V. Petrukhina
(Korolev Samara State Aerospace University, Russia)

12:20 – 12:40
WeG-5 Nigeria Space Programs
O. Aro, L. Adetoro
(National Space Research and Development Agency, Nigeria)

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Session "VEHICLE   CONTROL" WeV2
Co-Chairs: P. Castaldi (Italy), S. Kumkov (Russia)

12:00 – 12:20
WeV-4 Hierarchical Equilibrium in Two-level Aircraft Guidance-Stabilization
System
Ye. M. Voronov, A. A. Karpunin
(Bauman Moscow State Technical University, Russia)
V.A. Serov
(Moscow State University of Instrument Manufacture and Information Theory, Russia)

12:20 – 12:40
WeV-5 Perspectives for Development of an Autonomous & Intelligent WIG-Craft and its Peculiar Control Problems
S. Sharan, F. Arifuddin (*Vavasi Group, New Delhi, India*)
A.V. Nebylov *(International Institute for Advanced Aerospace Technologies, Saint Petersburg State University of Aerospace Instrumentation, Russia)*

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Poster Session WeP

WeP-1 On Electric Drive of the Reaction Wheels for the Small Spacecraft Attitude Control Systems
A.V. Sorokin, O.A. Kondratyev, D.O. Yakimovsky
(Federal State Unitary Enterprise "Command Devices Research Institute", Russia)

WeP-2 On a Calibration Accuracy of the Control Unit Clusters
A.A. Golozin
(Federal State Unitary Enterprise "Command Devices Research Institute", Russia)

WeP-3 Control Moment Gyro for the Agile Small Spacecraft
A.V. Sorokin, N.I. Bashkeyev
(Federal State Unitary Enterprise "Command Devices Research Institute", Russia)

WeP-4 Synthesis of Limited Control in Magnetic Suspension at Devices of the Navigation and Attitude Control Systems
V. S. Voronkov
(Architecture and Civil Building State University of Nizhny Novgorod, Russia)

WeP-5 Functionalization method in motion image analysis
P.K. Kuznetsov, B.V.Martemyanov, V.I. Semavin, E.Y. Chekotilo
(Samara State Technical University, Russia)

WeP-6 Control of Critical Regimes of Self-ignition
G.N. Gorelov
(Korolev Samara State Aerospace University, Russia)

WeP-7 On Optimizing Control in Aerospace Engineering at Perturbations, Restrictions and Stream of Faults
N.E. Rodnishev
(Tupolev Kazan State Technical University, Russia)

WeP-8 Optimizing Control of Nonlinear Stochastic Systems with Delay: Application for Flying Vehicle
R. Ayukasov, N.E. Rodnishev, N.S. Chernov
(Tupolev Kazan State Technical University, Russia)

WeP-9 Identification of Programmed Control and Intensity
of Perturbations for a Flying Vehicle
K. G. Denisov, V. D. Rodnishev
(Tupolev Kazan State Technical University, Russia)

WeP-10 Aircraft Flight Control with Convergence-based Anti-windup Strategy
A. Pogromsky, J.E. Rooda
(*Eindhoven University of Technology, The Netherlands*)
B. Andrievsky
*(Institute for Problems of Mechanical Engineering, Russian Academy
of Sciences, Russia)*

WeP-11 Methods and Models in Dynamics of Stabilization and Orientation Systems
L.K. Kuzmina
(Tupolev Kazan State Technical University, Russia)

WeP-12 Wavelet Analysis of Rotor Vibration
L. Banakh, A. Nikiforov
*(Mechanical Engineering Research Institute, f Russian Academy of
Sciences, Russia)*

WeP-13 Pulse-Width Modulated Control via Singular Perturbation
for a Spacecraft Attitude Maneuver
V. D. Yurkevich *(Novosibirsk State Technical University, Russia)*

WeP-14
Stabilization of Motion of Aerospace Vehicle in view of the Elasticity of its
Body
M. Adebayo
(National Space Research and Development Agency, Nigeria)

WeP-15 Temperature Measurement and Control Techniques of Flying
Vehicle Onboard Equipment
G. Adeniyi
(National Space Research and Development Agency, Nigeria)

WeP-16 Embedded System Control: Design and Implementation
on Multifunctional Sounding Rocket Ground Testing Equipment
L. Adetoro
(National Space Research and Development Agency, Nigeria)

WeP-17 Theory and Design of a Microelectro-mechanical System (MEMS)
Gyro and Accelerometers
A. Ajayi
(National Space Research and Development Agency, Nigeria)

WeP-18 Autopilot for intelligent autonomous aerospace vehicles
K. Aliyu
(National Space Research and Development Agency, Nigeria)

WeP-19 Investigating the Robust Methods used in Controlling Non-stationary Nonlinear Flexible Object
O. Aro
(National Space Research and Development Agency, Nigeria)

WeP-20 Investigation of Modern Equipment for Launching and Testing of a Sounding Rocket
J. Bawa
(National Space Research and Development Agency, Nigeria)

WeP-21 Investigation of Vibration Control Sensors of Flying Vehicles
T. Ibe
(National Space Research and Development Agency, Nigeria)

WeP-22 Digital Control Systems for Aerospace Application
I. Lawal
(National Space Research and Development Agency, Nigeria)

WeP-23 Investigation of Fuel Quantity and Consumption Sensors
of Flying Vehicles
F. Ogun
(National Space Research and Development Agency, Nigeria)

WeP-24 Transfer Function of Triple Modular Redundancy Fault-tolerant Sensor Systems
J. Opadere
(National Space Research and Development Agency, Nigeria)

WeP-25
Extended Kalman filter and Sigma-Points Kalman filters applied to integrated navigation system INS /GPS under selective Availability conditions
H. Benzerrouk *(Saad Dahlab University of Blida, Algeria)*
A. Ouldali *(Polytechnic Military School, Algeria)*

14:00 – 15:00 **Lunch**

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Wednesday, July 1, 15:00 – 17:00

15:00 – 17:00
Technical Visit   "Space & Samara"

Thursday, July 2, 10:00 – 12:00
Main Hall

Plenary Session ThPL1
Chair: H. Siguerdidjane (France)

10:00 – 10:40
ThPL-1
Adaptive Control Systems of Large Space Structures with Variable Parameters
V.Yu. Rutkovsky, V.M. Sukhanov, S.D. Zemlyakov, V.M. Glumov
(Institute of Control Science, Russian Academy of Sciences, Russia)

10:40 – 11:20
ThPL-2 Guidance and Nonlinear Fault Tolerant Control for a General Aviation Vehicle
G. Bertoni, P. Castaldi, N. Bertozzi, *(University of Bologna, Italy)*
M. Bonfe, S. Simani *(University of Ferrara, Italy)*

11:20 – 12:00
ThPL-3 Results from the Cassini / Huygens – Mission to Explore the Saturnian Moon Titan
K. Schilling *(Julius-Maximilians University, Germany)*

12:00 – 12:30   **Coffee Break**
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Thursday, July 2, 12:30 – 13:10
Main Hall

Plenary Session ThPL2
Chair: K. Schilling (Germany)

12:30 – 13:10
ThPL-4 Precise Guidance and Attitude Control Systems for the Information Satellites: Results and New Challenges
Ye.I. Somov (*Samara Scientific Center, Russian Academy of Sciences, Russia*)

13:10 – 13:50   **Panel Discussion**
"Problems of Automatic Control at Developing of Advanced Aerospace Vehicles and Systems"

13:50 – 14:00 **Closing Ceremony**
14:00 – 15:00 **Lunch**