

Ministry of Education and Science of Ukraine  
National Aviation University (NAU, Kyiv)



## **I-st International Conference**

# **«Methods and Systems of Navigation and Motion Control»**

October, 13-16, 2010  
Kyiv, Ukraine

**PROGRAMME**

**Kyiv – 2010**

**I-st International Conference  
Methods and Systems of Navigation and Motion Control**

CONFERENCE ORGANIZERS:

International Research and Educational Center of Information Technologies and Systems of  
National Academy of Science and Ministry of Education and Science of Ukraine (Kyiv)  
National Technical University of Ukraine “KPI” (Kyiv)  
National Aerospace University named after N. Zhukovsky “KhAI” (Kharkov, Ukraine)  
Central Research Institute of Navigation and Control of Ministry of Industrial Policy of Ukraine  
Branch of Cybernetic Problems of Transport & Aerospace Systems of Transport Academy of  
Ukraine  
International Organization “Academy of Navigation and Motion Control” (St. Petersburg, Russia)  
Kherson National Technical University (Ukraine)  
Kirovograd National Technical University (Ukraine)  
IEEE Aerospace and Electronic Systems Society  
IEEE Central Ukraine SP/AES Societies Joint Chapter

PROGRAMME COMMITTEE:

Committee Chair: Sineglazov V.M. – professor, Dr. of Sci.(Eng), IEEE Senior Member, Ukraine  
Co-Chairs: Yanovsky F.J. – Chair of the Ukrainian Chapter of IEEE SP/AES Societies, Professor, Dr. of Sci.(Eng), IEEE Fellow, Ukraine  
Azarskov V.M. –Professor, Dr. of Sci.(Eng), Ukraine  
TPC Chair: Tunik A.A. – Professor, Dr. of Sci.(Eng), IEEE Senior Member, Ukraine  
Committee’s Members: Blokhin L.M. – Professor, Dr. of Sci.(Eng), Ukraine  
Zbrutsky O.V. – Professor, Dr. of Sci.(Eng), Ukraine  
Kazak V.M. – Professor, Dr. of Sci.(Eng), Ukraine  
Kulyk A.S. – Professor, Dr. of Sci.(Eng), Ukraine  
Koshevoy M.D. – Professor, Dr. of Sci.(Eng), Ukraine  
Mashkov O.A. – Professor, Dr. of Sci.(Eng), Ukraine  
Pavlov V.V. – Professor, Dr. of Sci.(Eng), Ukraine  
Filyashkin M.K. – Professor, Cand. of Sci.(Eng), Ukraine  
Sushchenko O.A. – Associated Professor, Cand. of Sci.(Eng), Ukraine

## PROGRAMME

Wednesday, October 13, 2010

**09:00 – 10:00, Building 1, Hall                      Registration**

**Assembly Hall, Opening Session:**

**10:00 – 10:30 Welcome**

**10:30 – 12:00 Plenary Session**

**Computer-Integrated Navigation Complex of Unmanned Aerial Vehicles** *V.M. Sineglazov, M.K. Filyashkin, F.M. Zacharin, Sh.I. Askerov (National Aviation University, Kyiv, Ukraine)*

**Static Output Feedback Controller Design for Flight Control System Combined with Fuzzy Control under LMI Approach** *A.A.Tunik, M.M. Komnatska, A.M. Klipa (National Aviation University, Kyiv, Ukraine)*

**12:00 – 14:00 Break**

**14:00 – 16:00 Plenary Session**

**Using Fuzzy Logic Algorithms for the Unmanned Aerial Vehicle Controlling** *A.S. Kulik, O.E. Kopysov, A.V. Danchenko (National Aerospace University “KhAI”, Kharkiv, Ukraine)*

**Discrete Time Suboptimal Adaptive Control in the Presence of Input Constraints and Bounded Disturbances: a New Result** *L.S. Zhiteckii, V.M. Azarskov, L.M. Blokhin (National Aviation University, Kyiv, Ukraine)*

**Thursday, October 14, 2010**

**10:00 – 12:00, Building 5, Room 5.411**

**Session 1: Methods, Algorithms and Means of Navigation and  
Motion Control Systems Computer-Aided Design**

CHAIRMAN: *V.M. Sineglazov*

**Automated Control System of Aviation Electronic Equipment**  
*V.M. Sineglazov, V.M. Biliy (National Aviation University, Kyiv, Ukraine)*

**Minimally Redundant Reaction Wheel System of Spacecraft  
Angular Orientation with Active Fault-Tolerant Property** *A.S. Kulik,  
A.N. Taran (National Aerospace University “KhAI”, Kharkiv, Ukraine)*

**Accuracy Increasing of Nano-Technological Internal Gyro Vertical  
by Damping of Schuler’s Oscillations** *M.K. Filyashkin, M.P. Mukhina  
(National Aviation University, Kyiv, Ukraine)*

**Target Navigation Systems** *K.Yu. Dergachev, V.V. Morozov (National  
Aerospace University “KhAI”, Kharkiv, Ukraine)*

**Nonlinear Optimal Control of Air-to-Air Missiles** *S.E. Lyshevski,  
(Rochester Institute of Technology, USA)*

**Technical Support of CAD Systems of Aviation Electronic  
Equipment** *V.M. Sineglazov, A.V. Osadchiy (National Aviation  
University, Kyiv, Ukraine)*

**Optimal Choice of the Devices of Observation for Unmanned Aerial  
Vehicles** *O.N. Melnychenko, R.K. Kadem (National Aviation University,  
Kyiv, Ukraine)*

**Suboptimal Filtering of Integrated Inertial-Satellite Navigation System** *M.K. Filyashkin, T.I. Maryasova, M.V. Novik (National Aviation University, Kyiv, Ukraine)*

**10:00 – 12:00, Building 5, Room 5.503**

**Session 2: Methods and Algorithms of Adaptive, Robust and Optimal Motion Control Systems Synthesis**

CHAIRMAN: *A.A. Tunik*

**Design of Robust Control Laws for Fighter and Interceptor Aircraft** *Avnish P.S. Chauhan, S. E. Lyshevski (Rochester Institute of Technology, USA)*

**New Tasks and Algorithms of Synthesis of Optimum Structures of Regulators in the Open-Loop Multidimensional Control Systems of Management at Casual Influences** *L.M. Blohin, A.E. Mychlo, A.N. Troyanov, A.N. Shapka, V.O. Vinogradov (National Aviation University, Kyiv, Ukraine)*

**Neural Network Based Adaptive Control System for Aircrafts** *V.A. Apostolyuk, A.I. Dovgan (National Aviation University, Kyiv, Ukraine)*

**Compensation Algorithms for Coriolis Vibratory Gyroscopes** *Z.V. Didyk, V.A. Apostolyuk (National Aviation University, Kyiv, Ukraine)*

**Reliability Prediction of Metallic Resonator Coriolis Vibratory Gyroscope** *V.V. Chikovani (INNALABS HOLDING, Kyiv, Ukraine)*

**Double-Vector Algorithm of Orientation** *L.M. Ryzhkov, (National Technical University of Ukraine “KPI”, Kyiv, Ukraine)*

**Method of Undetermined External Disturbance Compensation in the Dynamic System with Control** I.O. Zagirska, O.V. Zbrutsky  
(National Technical University of Ukraine “KPI”, Kyiv, Ukraine)

**Structural Identification of the Models of the Multidimensional Objects Dynamics** U.N. Bezkorovayniy, V.G. Vovk, D.O. Shevchuk  
(National Aviation University, Kyiv, Ukraine)

**14:00 – 15:00 Excursion to Museum  
of the National Aviation University**

**15:00–17:00 Excursion to Hangar  
of the National Aviation University**

**Friday, October 15, 2010**

**10:00 – 12:00, Building 5, Room 5.411**

**Session 1: Methods, Algorithms and Means of Navigation and  
Motion Control Systems Computer-Aided Design**

CHAIRMAN: V.M. Sineglazov

**Simulator for Training of Relay Defence Service Operators**  
O.P. Baranovska (National Aviation University, Kyiv, Ukraine)

**Algorithmic Support Testing of Aircraft Structures** V.M. Sineglazov,  
V.P. Podolsky (National Aviation University, Kyiv, Ukraine)

**Modern Aircraft Computer Integrated Complexes** V.M. Konyushko  
(National Aviation University, Kyiv, Ukraine)

**The New Model of Informative Signal for Ring Laser Gyroscope**  
M.P. Maryasov, T.I. Maryasova, O.P. Maryasova (National Aviation  
University, Kyiv, Ukraine)

**Modern Aircraft Laser Gyroscopes** V.M. Konyushko (National Aviation University, Kyiv, Ukraine)

**Peculiarities of Gasodynamic Method of UAV Landing** N.F. Tupitsin, (National Aviation University, Kyiv, Ukraine)

**Simulation Maneuver Differences Aircraft in a Conflict Situation with the Use of CCV Technology** V.V. Pavlov, K.A. Kopytova (International Research and Educational Center of Information Technologies and Systems of National Academy of Science and Ministry of Education and Science of Ukraine, Kyiv, Ukraine)

**Implementation of Indirect Field Oriented Control with Fuzzy Logic Controller for Induction Motor** Elabed Saud (Musrata University, Koms , Libya)

**Way of the Pilot's Training to Arbitrary Program Control of the Plane's Motion** V.I. Kashmatov (National Aviation University, Kyiv, Ukraine)

**10:00 – 12:00, Building 5, Room 5.503**

**Session 2: Methods and Algorithms of Adaptive, Robust and Optimal Motion Control Systems Synthesis**

CHAIRMAN: A.A. Tunik

**Design Criteria and Applications of Motion Simulators Used in Research and Testing of Inertial Sensor Packages for Space Applications** M. Williams, M. Kaegi (ACUTRONIC Switzerland Ltd, Switzerland)

**Feedback-Feedforward Control of the RUAV in Hovering Mode** O.D. Gorbatyuk, (National Aviation University, Kyiv, Ukraine)

**Providing Active Fault-Tolerance of Satellite Orientation and Stabilization Systems** *A.S. Kulik, O.A. Luchenko (National Aerospace University “KhAI”, Kharkiv, Ukraine)*

**LMI - Based Static Output Feedback Design for Rotating Solid Body** *A.A. Tunik, O.P. Basanets, M.M. Komnatska, (National Aviation University, Kyiv, Ukraine)*

**Symbolic Simulation of Complex Dynamic Systems at the Transport Industry** *G.L. Baranov, A.N. Nosovskiy, S.M. Vasko (The Central Research Institute of Navigation and Control, Kyiv, Ukraine)*

**Model Design and Flight Control System Synthesis** *(M.M. Komnatska, T.A. Galaguz, (National Aviation University, Kyiv, Ukraine)*

**Synthesis of Robust Stabilizing System for Marine Navigation Complexes** *O.A. Sushchenko (National Aviation University, Kyiv, Ukraine)*

**Expressions for Counterpropagating Waves Beat Frequency of Uniformly Rotating Laser Gyro** *E. A. Bondarenko, (National Technical University of Ukraine “KPI”, Kyiv, Ukraine)*

**14:00 – 15:00 Excursion to the Aviation Museum**