

INTERNATIONAL WORKSHOP  
**NMC 2016**  
NAVIGATION & MOTION CONTROL  
26-30 September 2016, Russia

# International Workshop on Navigation and Motion Control

September 26 – 30, 2016

## PROGRAM



КАФЕДРА  
ИНФОРМАЦИОННО-  
НАВИГАЦИОННЫХ  
СИСТЕМ



INTERNATIONAL WORKSHOP  
**NMC 2016**  
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on Navigation and Motion Control  
September 26 – 30, 2016

### September 26 (Monday)

8.30	Meeting at 9a, Bolshaya Posadskaya St., Concern CSRI Elektropribor, JSC
9.00	Bus departure
13.00	Arrival at the destination
14.00 - 15.00	Lunch
15.00 - 15.10	<b>Welcome and introduction. O.A. Stepanov</b> (Concern CSRI Elektropribor, JSC; ITMO University, Russia)
	<b>Session 1. Chair Yu.A. Litvinenko</b> (Concern CSRI Elektropribor, JSC; ITMO University, Russia)
15.10 - 16.00	<b>B.S. Rivkin</b> (Concern CSRI Elektropribor, JSC, Russia) GNSS. Systems and technologies
16.00 - 16.50	<b>R. Piche</b> (Tampere University of Technology, Finland) Indoor positioning particle filter
16.50 - 17.00	Break
17.00 - 17.50	<b>V.G. Peshekhonov</b> (Concern CSRI Elektropribor, JSC, Russia) Prospects of gyro technologies
18.00 - 19.00	Dinner

### September 27 (Tuesday)

09.00 - 10.00	Breakfast
	<b>Session 2. Chair A.V. Motorin</b> (Concern CSRI Elektropribor, JSC; ITMO University, Russia)
10.00 - 10.45	<b>S.G. Revnivykh</b> (Reshetnev Information Satellite Systems Corporation, JSC, Russia) State and development of GLONASS as a part of the world GNSS
10.45 - 11.30	<b>G.F. Trommer</b> (KIT University, Germany; ITMO University, Russia) Image based navigation using landmarks
11.30 - 11.45	Break
11.45 - 12.10	<b>G.F. Trommer</b> (KIT University, Germany; ITMO University, Russia), <b>N. Kronenwett</b> (KIT University, Germany) Motion monitoring based on a finite state machine for precise indoor localization
12.10 - 12.35	<b>M. Mansour</b> (ITMO University, Russia) Nonlinear filtering methods for indoor navigation

### CO-SPONSORED BY:

State Research Center of the RF Concern CSRI Elektropribor, JSC  
Russian Foundation for Basic Research  
International Public Association - Academy of Navigation and Motion Control  
St. Petersburg Group of the Russian National Committee on Automatic Control  
St. Petersburg Electrotechnical University "LETI"

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**September 27  
 (Tuesday)**

- 12.35 – 13.00 **O.V. Zaitsev** (*ITMO University; CSRI Elektropribor, Russia*)  
 GNSS data processing under uncertainty of their models
- 13.00 – 14.30 **Lunch**
- Session 3. Chair A.S. Nosov** (*Concern CSRI Elektropribor, JSC; ITMO University, Russia*)
- 14.30 – 15.15 **R. Piche** (*Tampere University of technology, Finland*)  
 Off-line estimation of state space model parameters
- 15.15 – 15.40 **G. Scholz, S. Prophet, M. Popp** (*KIT University, Germany*),  
**G.F. Trommer** (*KIT University, Germany; ITMO University, Russia*)  
 Guiding quadrotors through unknown environment using potential fields
- 15.40 – 16.05 **T. Wald, G. Scholz** (*KIT University, Germany*),  
**G.F. Trommer** (*KIT University, Germany; ITMO University, Russia*)  
 Automatized hybrid control optimization of a non-linear MAV
- 16.05 – 16.30 **G.F. Trommer** (*KIT University, Germany; ITMO University, Russia*),  
**J. Atman** (*KIT University, Germany*)  
 Motion navigation aiding by a hybrid laser-camera motion estimator for micro aerial vehicles
- 16.30 – 16.55 **Lyan Cin** (*ITMO University, Russia*),  
**Yu.A. Litvinenko** (*Concern CSRI Elektropribor, JSC; ITMO University, Russia*)  
 Complementary filter for estimation of inertial device errors
- 16.55 – 17.10 **Break**
- 17.10 – 18.20 **N.T. Zhigunova** (*Concern CSRI Elektropribor, JSC, Russia*)  
 Writing scientific papers in English: Grammar and vocabulary
- 18.20 – 19.20 **Dinner**

**September 28  
 (Wednesday)**

- 09.00 – 10.00 **Breakfast**
- Session 3. Chair G.Scholz** (*KIT University, Germany*)
- 10.00 – 10.20 **V.V. Bogomolov** (*ITMO University, Russia*)  
 Approximate expressions for accuracy of a strapdown inertial navigation system in autonomous mode

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**September 28  
 (Wednesday)**

- 10.20 – 10.40 **N.J. Mrisho** (*Saint Petersburg Electrotechnical University "LETI", Russia*)  
 Searching for a suitable frequency estimation technique in estimating the Earth rotation rate with the large ring laser (G-ring laser) data
- 10.40 – 11.00 **B. Baruti** (*Saint Petersburg Electrotechnical University "LETI", Russia*)  
 Solar balloon based satellite navigation system
- 11.00 – 11.20 **E.V. Lukoyanov** (*ITMO University, Russia*)  
 Using fuzzy interacting observers for fault diagnosis in systems with parameter uncertainty
- 11.20 – 11.40 **Break**
- Session 4. Chair V.V. Tsodokova** (*Concern CSRI Elektropribor, JSC, Russia*)
- 11.40 – 11.55 **I.Yu. Merkulova, M. Mansour** (*ITMO University, Russia*)  
 About the practical training at Tampere University of technology (Finland)
- 11.55 – 12.10 **G. Scholz** (*KIT University, Germany*)  
 On the 2016 DGON Inertial Sensors and Systems (ISS) Symposium Gyro Technology
- 12.10 – 12.25 **A.A. Anikina** (*Concern CSRI Elektropribor, JSC, Russia*),  
**O.V. Zaitsev** (*ITMO University; CSRI Elektropribor, Russia*)  
 On the 25th International Scientific and Technical Conference *Current Technologies in the Problems of Control, Automation and Data Processing*
- 12.25 – 12.40 **E.O. Kishko** (*Concern CSRI Elektropribor, JSC, Russia*)  
 Workshop on Navigation and Motion Control
- 12.40 – 14.10 **Lunch**
- Session 5. Chair D.P. Eliseev** (*Concern CSRI Elektropribor, JSC, Russia*)
- 14.10 – 15.00 **S.A. Kolyubin, A.A. Bobtsov** (*ITMO University, Russia*)  
 Control in cyber physical systems. Myths and legends or subjective opinion of speakers
- 15.00 – 15.50 **I.B. Furtat** (*Institute of Problems of Mechanical Engineering Russian Academy of Sciences (IPME RAS); ITMO University, Russia*)  
 Control of multi-agent systems and its application for control of multi-machine power systems
- 15.50 – 16.00 **Break**
- 16.00 – 16.25 **S.A. Zagrebin** (*Concern CSRI Elektropribor, JSC; ITMO University, Russia*)  
 Simulation of towed antenna dynamics
- 16.25 – 16.50 **A.S. Voronov** (*Concern CSRI Elektropribor, JSC; ITMO University, Russia*)  
 Increasing the strength of deep sea ships' electromagnetic logs

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### September 28 (Wednesday)

16.50 – 17.15

**A. Ndayishimiye** (*Saint Petersburg Electrotechnical University "LETI", Russia*)  
Gyrocompass with auto-compensated instrumental errors

17.15 – 17.40

**N.K. Kulachenkov** (*Concern CSRI Elektropribor, JSC, Russia*)  
Nuclear magnetic resonance gyroscope. A brief review

17.40 – 18.30

Discussion of the papers submitted for publication in the Proceedings of the Conference of Young Scientists *Navigation and Motioncontrol*

18.30 – 19.30

Dinner

### September 29 (Thursday)

09.00 – 10.00

Breakfast

10.00 – 16.00

Cultural and Entertainment program

16.00 – 17.00

Lunch

20.00

Banquet

### September 30 (Friday)

09.00 – 10.00

Breakfast

10.00 – 10.45

**Session 6. Chair Ya.V. Belyaev** (*Concern CSRI Elektropribor, JSC, Russia*)

**M.M. Pilipko** (*Peter the Great St. Petersburg Polytechnic University, Russia*)  
Design of sigma-delta analog-to-digital converter

10.45 – 11.10

**D.V. Kostygov** (*Concern CSRI Elektropribor, JSC, Russia*)  
Digital design flow for MEMS accelerometer

11.10 – 11.35

**Yu.A. Andryakov** (*Concern CSRI Elektropribor, JSC, Russia*)  
Design and optimization of MMA front-end

11.35 – 12.00

**A.A. Anikina** (*Concern CSRI Elektropribor, JSC, Russia*)  
Limitations of CMOS technology in switched-capacitors DAC design

12.00 – 13.00

Discussion of the papers submitted for publication in the Proceedings of the Conference of Young Scientists *Navigation and Motioncontrol*

13.00 – 14.00

Lunch

14.00 – 14.20

Closing Ceremony

16.00

**O.A. Stepanov** (*Concern CSRI Elektropribor, JSC; ITMO University, Russia*)

Departure to Saint-Petersburg



## WORKSHOP WORKING GROUP IN CSRI ELEKTROPRIBOR

### CONTACT INFORMATION:

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# INTERNATIONAL LABORATORY «INTEGRATED NAVIGATION AND ATTITUDE REFERENCE SYSTEMS»

International Laboratory «Integrated navigation and attitude reference systems» was founded under the auspices of "Information and navigation system" Department with The State Research Center of the Russian Federation – Concern CSRI Elektropribor, JSC (<http://www.elektropribor.spb.ru/>). It is the leading research institute in Russia in the area of high-precision navigation, gyroscopy, gravimetry. The laboratory is engaged in research and development of integrated navigation and attitude reference systems for various types of vehicles.

## RESEARCH AREAS:

- Improvement of methods for processing of redundant navigation information.
- Development of methods for designing small-sized inertial satellite integrated navigation and attitude reference systems for various types of vehicles and robotic devices.
- Development of methods for designing small-sized systems for individual navigation and guidance.
- Improvement of GNSS receivers.
- Development and design of inertial sensors for navigation systems using up-to-date computer technologies.

## HEADS OF THE INTERNATIONAL LABORATORY:

### Oleg Stepanov

Professor, D.Sc. in Engineering (Russian Scientific Degree "Doctor of Technical Sciences")  
ITMO University

### Gert Trommer

Director, Professor, Ph.D  
Institute of Systems Optimization of Karlsruhe Institute of Technology, Germany

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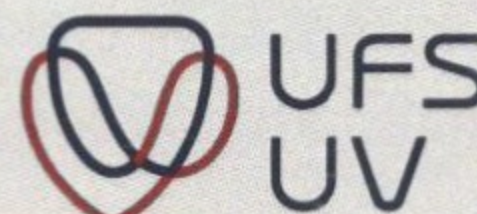
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