

INTERNATIONAL UNION  
OF THEORETICAL AND APPLIED MECHANICS



IUTAM SYMPOSIUM 12-3 = GA.10-08  
"WAVES IN FLUIDS: EFFECTS OF NON-LINEARITY,  
ROTATION, STRATIFICATION AND DISSIPATION"

Moscow, June 18-22, 2012

PROGRAMME



A. Ishlinsky Institute for Problems in Mechanics of the RAS

Moscow 2012

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"WAVES IN FLUIDS: EFFECTS OF NON-LINEARITY,  
ROTATION, STRATIFICATION AND DISSIPATION"

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SCIENTIFIC PROGRAM:

- Linear and non-linear models of waves: rotation, stratification and dissipation effects;
- Waves in deep, intermediate depth and shallow water;
- Fine structure, stability and instabilities of waves;
- Interaction of waves of the same and different nature (inertial, gravity surface and internal, capillary, acoustic);
- Forcing action of waves on obstacles;
- Wave transport of substances and energy;
- Measurements and remote sensing of wave fields in the environment and the laboratory.

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Chair of the Symposium – Professor Yuli D. CHASHECHKIN  
Representative of IUTAM: Academician F.L. CHERNOUSKO

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SYMPOSIUM SPONSORS:

INTERNATIONAL UNION OF THEORETICAL AND APPLIED MECHANICS  
(IUTAM)

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RUSSIAN NATIONAL COMMITTEE ON THEORETICAL AND APPLIED  
MECHANICS

RUSSIAN FOUNDATION FOR BASIC RESEARCH

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SYMPOSIUM WORKGROUP

R.N. Bardakov, V.G. Baydulov, T.O. Chaplina, Yu.D. Chashechkin, E.V. Stepanova  
(all IPMech RAS)



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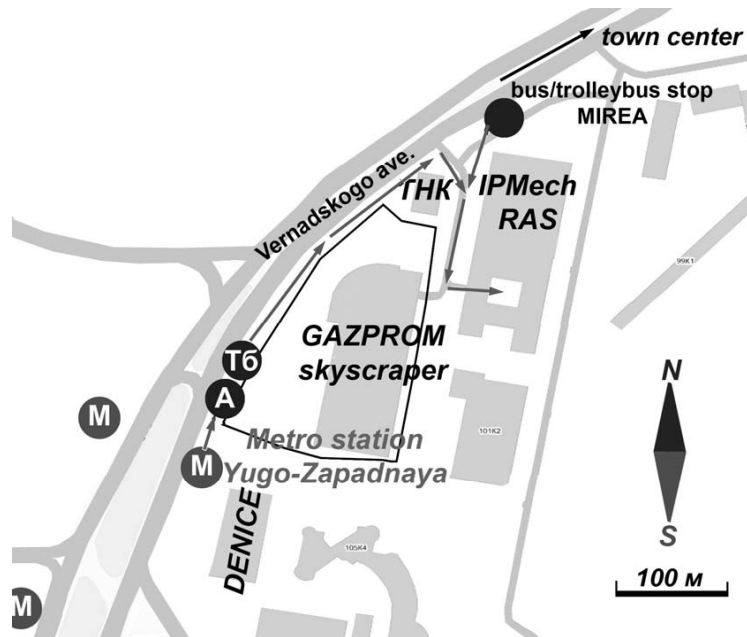
IUTAM SYMPOSIUM 12-3 = GA.10-08

“WAVES IN FLUIDS: EFFECTS OF NON-LINEARITY,  
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Will be held in

A. Ishlinsky Institute for Problems in Mechanics of the RAS  
119526, Russia, Moscow, Vernadskogo ave., 101, build. 1

June 18-22, 2012



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## SCHEDULE OF THE

IUTAM SYMPOSIUM 12-3 = GA.10-08

“WAVES IN FLUIDS: EFFECTS OF NON-LINEARITY,  
ROTATION, STRATIFICATION AND DISSIPATION”

*Monday, June 18 – Friday, June 22, 2012*

08:30 – 15:00 **Registration**  
*Room 253 in IPMech RAS*

10:00 – 18:00 **Sections**

**All the talks will be presented in the Lecture Hall of the  
IPMech RAS**

### SYMPOSIUM SCIENTIFIC COMMITTEE

Professor Yu.D. Chashechkin (RU) – chairman,  
Professor K. Bajer (PL), Professor D.G. Dritschel (UK),  
Professor H.J.S. Fernando (USA), Professor J. Grue (NO),  
Professor J.-M. Redondo (ES), Professor L. Shemer (IL),  
Professor C. Staquet (FR).

### Talks types

**Invited Plenary lectures** – 30 minutes (including questions)

**Oral presentations** – 20 minutes  
(including questions)

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“WAVES IN FLUIDS: EFFECTS OF NON-LINEARITY,  
ROTATION, STRATIFICATION AND DISSIPATION”

Moscow, June 18-22, 2012

**Monday, June 18, 2012**

**Opening ceremony**

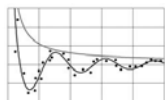
**Greetings :**

10:00 – 10:15 Director of the A.Ishlinsky Institute for Problems in Mechanics  
academician F.L. Chernousko,  
Professor Chashechkin Yu.D.

**Morning section, June18, 2012**

10:30 – 10:50 *Zagumennyi Ia. V.* Diffusion-Induced Flows on a  
Strip: Theoretical, Numerical and Laboratory  
Modeling

10:50 – 11:10 *Aktershev S.P., Alekseenko S.V.* New Model for  
Waves in a Falling Film



11:10 – 11:30 *Sazhin S.S., Boronin S.A., Begg S., Crua C., Heikal M.R.,  
Healey J., Lebedeva N.A., Osipov A.N., Kaplanski F.*  
Jets and Vortex Ring-Like Structures in Internal  
Combustion Engines: Stability Analysis and  
Analytical Solutions

11:30 – 11:50 *Kozlov V.G., Polezhaev D.A.* Inertial Waves and  
Acoustic Streaming in Rimming Flows

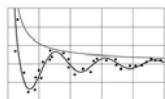
11:50 – 12:10 *Kuibin P.A., Sharypov O.V.* Effects of Inertia and  
Thermocapillarity in Non-Isothermal Film Flow



12:10 – 12:30 *Coffee- break*

**Morning section, June18, 2012**

12:30 – 12:50 *Sokolovskiy M.A., Filyushkin B.N., Carton X.*  
Modelling of Interaction of Intrathemocline Vortex  
with the Ridge Seamounts in Vicinity of Critical  
Points of Currents



12:50 – 13:10 *Reznik G.M.* Geostrophic Splitting and Gyroscopic  
Waves

13:10 – 13:30 *Kistovich A.V.* The Exact Complex-Valued  
Solution for Steady Surface Waves

13:10 – 13:30 *Chaplina T.O.* Transport of Oil in a Compound Vortex



13:50 – 15:00 *Lunch*



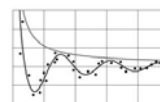
“WAVES IN FLUIDS: EFFECTS OF NON-LINEARITY,  
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Moscow, June 18-22, 2012

**Monday, June 18, 2012**

**Afternoon section, June 18, 2012**

15:00 – 15:20 *Ermakov M.K.* Stability of Thermocapillary  
Convection in a Liquid Bridge at High-Prandtl  
Number



15:20 – 15:40 *Lukin S.V., Urmancheev S.F.* Capillary Effects at  
Wave Propagation in Porous Media

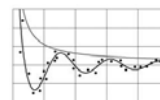
15:40 – 16:00 *Baydulov V.G.* On the Acoustic Precursors of  
Convective Structures in a Stratified Fluid



16:00 – 16:30 *Coffee- break*

**Afternoon section, June 18, 2012**

16:30 – 16:50 *Khizbullina S.F., Urmancheev S.F.* Oscillation  
Regimes of Dynamic Parameters Changing in  
Couette Flow of Anomalous Thermoviscous  
Liquids



16:50 – 17:10 *Arkhipov D.G., Khabakhpashev G.A.* New Model  
Equations for the Nonlinear Waves Interaction in  
Shallow Water

17:10 – 17:30 *Kurakin L.G.* Stability, Resonances and Instability  
of the Steady Rotation of a System of Three  
Equidistant Vortices Outside a Circle



18:00 – 19:00 *Ice-break reception*



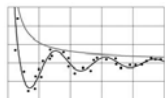
“WAVES IN FLUIDS: EFFECTS OF NON-LINEARITY,  
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Moscow, June 18-22, 2012

**Tuesday, June 19, 2012**

**Morning section, June 19, 2012**

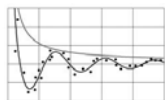
- 10:00 – 10:20 *Ilyinykh A.Yu.* Waves of drop impact  
 10:20 – 10:40 *Golitsyn G.S.* The Role of Viscosity in the Contaminant Diffusion in the Field of Wind Surface Waves  
 10:40 – 11:00 *Druzhinin O.A., Troitskaya Yu.I.* The radiation of Internal waves by a turbulent fountain in a stratified fluid  
 11:00 – 11:20 *Byalko A.V.* Underwater Gas Tornado: First Experiments and Initial Theoretical Analysis  
 11:20 – 11:40 *Vasiliev A.Yu.* Power and Energy Characteristics of the Internal Wave Beams in a Continuously Stratified Fluid



11:40 – 12:00 *Coffee- break*

**Morning section, June 19, 2012**

- 12:00 – 12:30 *Paoletti M.S., Swinney H.L.* Propagating and Evanescent Internal Waves in a Model of the Deep Ocean (invited)  
 12:30 – 13:00 *Chashechkin Yu.D.* The Complex Structure of Wave Fields in Fluids (invited)  
 13:00 – 13:20 *Tyugin D.Yu., Kurkin A.A., Kurkina O.E.* Improved Version of Software Package for Modeling of Internal Gravity Waves in the World Ocean



13:20 – 15:00 *Lunch*



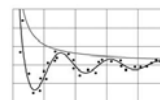
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Moscow, June 18-22, 2012

**Tuesday, June 19, 2012**

**Afternoon section, June 19, 2012**

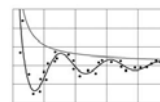
- 15:00 – 15:20 *Meshkov E.E., Oreshkov V.O., Fedorenko Ya.V., Yanbaev G.M.* Transformation of Flying Cylindrical Water Shell  
 15:20 – 15:40 *Prokhorov V.E.* Internal Waves and Microstructure Detected in a Field of Ultrasonic Backscattering of the Stratified Flow  
 15:40 – 16:00 *Blekhman I.I., Blekhman L.I., Vaisberg L.A., Sorokin V.S., Vasilkov V.B., Yakimova K.S.* Motion of Gas Bubbles and Rigid Particles in Vibrating Fluid-Filled Volumes



16:00 – 16:20 *Coffee- break*

**Afternoon section, June 19, 2012**

- 16:20 – 16:40 *Serebryany A.N.* Observations of Nonlinear Internal Waves and Connected Processes in the Sea Using ADCP  
 16:40 – 17:00 *Fuka V., Brechler J.* Large Eddy Simulation of the Stratified Flow Over Terrain Obstacles: First Results  
 17:00 – 17:20 *Denisova M.O., Kostarev K.G., Shmyrov A.V.* Non-Stationary Modes of Solutal Convection Caused by Surfactant Diffusion Through the Interface  
 17:20 – 17:40 *Gadzhimagomedov G.G., Vlasov V.A., Lutovinov V.M., Sboev D.S.* PIV Based Measurements of Aerodynamic Loads  
 17:40 – 18:00 *Kurkina O.E., Kurkin A.A., Averbukh E.L., Tyugin D.Y.* Modeling of internal gravity waves and their surface manifestations in the Baltic Sea



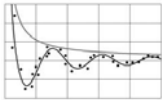
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Moscow, June 18-22, 2012

**Wednesday, June 20, 2012**

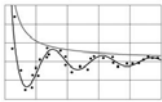
**Morning section, June 20, 2012**

- 10:00 – 10:20 *Stepanova E.V.* Dye Transport Pattern in Compound Vortex Flow
- 10:20 – 10:40 *Denisova M.O., Kostarev K.G.* Occurrence of the Motion of a Fluid with a Free Surface of Small Area
- 10:40 – 11:00 *Moiseev K.V., Volkova E.V., Urmancheev S.F.* Effect of Convection on PolymeraseChain Reaction in a Closed Cell
- 11:00 – 11:20 *Bakunin O.G.* Stochastic Instability Increment in Two Dimensional Turbulent Flows in the Presence of Inverse Cascade
- 11:20 – 11:50 *Coffee- break*



**Morning section, June 20, 2012**

- 11:50 – 12:20 *Shemer L., Noskowicz S.H.* On Kinematics and Dynamics of Breaking Water Waves (invited).
- 12:20 – 12:40 *Cherevko A.A., Chupakhin A.P., Ivanova A.V., Ostapenko V.V.* Numerical Simulation Problem of Discontinuity Disintegration on Rotating Attractive Sphere
- 12:40 – 13:00 *Sergeev D.A., Troitskaya Yu.I., Kandaurov A.A.* Experimental Modeling of Air-Sea Interaction Under Hurricane Wind Conditions
- 13:00 – 13:20 *Gavrilov N.V., Liapidevskii V.Yu., Khrapchenkov F.F.* Solitary Internal Waves in a Shelf Zone
- 13:20 – 13:40 *Slunyaev A.V., Shrira V.I.* The Problem of the Highest Wave in a Group: Fully Nonlinear Simulations of Water Wave Breathers Vs Weakly Nonlinear Theory



13:40 – 15:00 *Lunch*



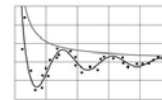
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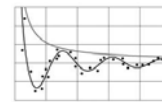
**Afternoon section, June 20, 2012**

- 15:00 – 15:20 *Gorodtsov V.A.* Wave-Vortex Disturbances in Stratified Viscous Fluids.
- 15:20 – 15:40 *Erofeev V.I., Tkach M.E., Soldatov I.N.* Gyroscopic Waves in a Rotating Layer of Conducting Viscous Fluid in a Constant Magnetic Field
- 15:40 – 16:00 *Mokhov I.I., Chefranov S.G., Chefranov A.G.* Interaction of Global-Scale Atmospheric Vortices: Modelling Based on Hamiltonian Dynamic System of Antipodal Point Vortices on Rotating Sphere
- 16:00 – 16:20 *Coffee- break*



**Afternoon section, June 20, 2012**

- 16:20 – 16:40 *Harlander U., Koch S., Borcia I., Seelig T., Herzog N., Egbers C., Kurgansky M.V., Will A., Hollerbach R.* Inertial Waves Driven by Modulated Rotation: Spherical Shell and Annulus Geometry
- 16:40 – 17:00 *Budnikov A.A.* The Floating Markers Shifting on the Compound Vortex Surface
- 17:00 – 17:20 *Kuznetsova D.V., Sibgatullin I.N.* Specifics of Convective Regimes in the Presence of Density Maximum
- 17:20 – 17:40 *Fedyushkin A.I., Rozhkov A.N.* Investigation of the Impact and Spreading of Liquid Drops on Solid Surfaces
- 17:40 – 18:00 *Bulatov V.V., Vladimirov Yu.V.* Wave Dynamics of Stratified Mediums with Variable Depth: Exact Solutions and Asymptotic Representations



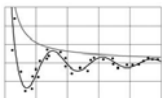
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**Thursday, June 21, 2012**

**Morning section, June 21, 2012**

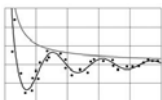
- 10:00 – 10:20 *Georgievskaya A.B., Krasovsky G.B., Meshkov E.E., Ogorodnikov L.L., Tochilina A.A.* Hydrodynamic Models of Plane and Converging Cylindrical Shock Waves
- 10:20 – 10:40 *Chupakhin A.P., Cherevko A.A., Khe A.K., Telegina N.Yu., Krivoshepkin A.L., Orlov K.Yu., Panarin V.A., Baranov V.I.* Hemodynamics of Cerebrovascular Anomalies
- 10:40 – 11:00 *Kistovich A.V.* The Integration of Multiscale Functions
- 11:00 – 11:20 *Zagumennyi Ia.V., Bardakov R.N.* Ground Effect in Hydrodynamics of a Strip in a Stratified Fluid



11:20 – 12:00 *Coffee- break*

**Morning section, June 21, 2012**

- 12:00 – 12:30 *Grue J.* Method for Interfacial Motion of Very Large Amplitude. Documentation of Mathematical Formulation and Numerical Experiments (invited)
- 12:30 – 12:50 *Akulenko L.D., Kalinichenko V.A., Nesterov S.V.* Sharp Topographic Changes Impact on Seiches Characteristics
- 12:50 – 13:10 *Kalinichenko V.A., Wongwises S.* The Effect of Viscoelasticity on Breaking Standing Waves
- 13:10 – 13:30 *Troitskaya Yu.I., Sergeev D.A., Kandaurov A.A.* Laboratory Investigation of the Wind Wave Surface Spectra for Smooth and Steep Waves



13:30 – 15:00 *Lunch*



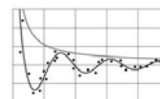
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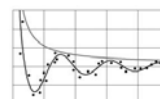
**Afternoon section, June 21, 2012**

- 15:00 – 15:20 *Babiy V.I., Babiy M.V.* Some Statistical Features Small-Scale Structure of Temperature Inhomogeneities in Sea
- 15:20 – 15:40 *Reutov V.P., Rybushkina G.V.* Numerical Simulation of Different-Scale Convective Structures in Evapoeating Liquid Layer with Shear Current
- 15:40 – 16:00 *Kozlov N.* Inertial Oscillations and Average Dynamics of a Light Cylinder in Rotating Cavity with Liquid
- 16:10 – 16:30 *Coffee- break*



**Afternoon section, June 21, 2012**

- 16:30 – 16:50 *Aktershev S.P., Kuibin P.A.* Stability of Swirl Axisymmetric Incompressible Flow
- 17:00 – 17:20 *Baydulov V.G., Trofimov A.A.* The Flow Caused by Rotation of a Horizontal Cylinder in a Stratified Fluid
- 17:20 – 17:40 *Bardakov R.N.* Study of Flows Arising from the Torsional Oscillations of Horizontal Disk in an Inhomogeneous Fluid
- 17:40 – 18:00 *Fedyushkin A.I.* Heat Transfer of Water in Channel Flow with and without the Vibrations and Boiling



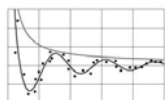
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**Friday, June 22, 2012**

**Morning section, June 22, 2012**

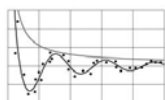
- 10:00 – 10:20 *Elkin D.N., Kremenetskiy V.V., Zatsepin A.G.* Laboratory Study of Horizontal Mixing Process Between Two River Plumes at the Sea Shelf (with an Application to the Kara Sea)
- 10:20 – 10:40 *Nesterov S.V.* Influence of a Vertical Electric Field on the Boundary Between Two Liquids (Theory and Experiment)
- 10:40 – 11:00 *Meshkov E.E., Sirotkin A.A., Zamyslov D.N.* Bath-Tube Vortex Attenuates with the Increase of In-Vessel Water Level
- 11:20 – 11:40 *Vulfson A.N., Borodin O.O.* Kinetic Theory and Distribution of Thermals over Velocities in a Turbulent Convective Mixed Layer



11:40 – 12:00 *Coffee-break*

**Morning section, June 22, 2012**

- 12:00 – 12:30 *Dritschel D.G.* Waves and Turbulence: Their Cooperative Role in Structure Formation (invited)
- 12:30 – 12:50 *Koshel K.V., Aleksandrova O.V., Kosolapkin G.U.* Numerical Modeling of the Diffusion of Passive Tracers in a Random Velocity Field
- 12:50 – 13:10 *Prokhorov V.E.* Surface Waves Excited by Ultrasound
- 13:10 – 13:30 *Shagalov S.V., Rybushkina G.V.* Nonlinear Interaction of the Unstable Normal Modes of a Parallel Shear Flow in Rotating Stratified Fluid Near the Onset of the Instability



13:30 – 15:00 *Lunch*



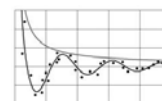
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**Friday, June 22, 2012**

**Afternoon section, June 22, 2012**

- 15:00 – 15:20 *Novotryasov V.V., Stepanov D.V.* On the tracer advection by nonlinear coastal kelvin wave
- 15:20 – 15:40 *Belyaev I.V., Faranosov G.A., Kopiev V.A., Zaytsev M.Yu.* Acoustic Forcing for Instability Wave Control in Turbulent Jets
- 15:40 – 16:00 *Berloff P.* Dispersive Waves and Nonlinear Effects in Stratified and Rotating Anisotropic Turbulence
- 16:00 – 16:20 *Vladimirov V. A.* MHD-Drift Equations: from Langmuir circulations to MHD-dynamo?
- 16:20 – 16:40 *Vladimirov V. A.* Theory of Moderately Oscillating Flows



16:40 – 17:00

**Closure ceremony of the Symposium**



18:30 – 20:00 **Symposium Dinner**

