QUASILINEAR EQUATIONS,
INVERSE PROBLEMS
AND THEIR APPLICATIONS


Conference handbook and proceedings
Gennadi Markovich Henkin
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Complex and Functional Analysis &
Mathematical Economics & Quasilinear
Equations & Integral Geometry
& Inverse Problems

Central Economics and Mathematics Institute, Russia &
Université de Pierre et Marie Curie, France &
Moscow Institute of Physics and Technology, Russia
Conference program
Monday, September 12th. Phystech.Bio

Section «Nonlinear PDEs and dynamical systems»
Chair: A. Tumanov

14:30: N. S. Petrosyan (MSTU «STANKIN», Russia)
«Asymptotics of solutions of the Cauchy problem for a quasilinear first order equation with several space variables»
We investigate the convergence as time increases indefinitely of the solutions of the Cauchy problem for a scalar quasilinear first-order conservation law with several space variables to the solutions of the one-dimensional problem of decay of discontinuity (the Riemann problem).

15:05: A. V. Romanov (Higher School of Economics, Russia)
«On normally hyperbolic inertial manifolds of evolutionary equations»
For 3D reaction–diffusion equations, we study the problem of existence or nonexistence of an inertial manifold that is normally hyperbolic or absolutely normally hyperbolic. We present a system of two coupled equations with a cubic nonlinearity which does not admit a normally hyperbolic inertial manifold. An example separating the classes of such equations admitting an inertial manifold and a normally hyperbolic inertial manifold is constructed. Similar questions concerning both absolutely normally hyperbolic inertial manifolds and more general evolutionary equations are discussed.

15:40: Coffee break

16:00: V. V. Vedenyapin, M. A. Negmatov, N. N. Fimin (Keldysh Institute of Applied Mathematics, Russia)
«Hydrodynamics and kinetics of Vlasov and Liouville equations»

16:35: A. V. Podoroga, I. V. Tikhonov (Moscow State University, Russia)
«On stability of special solutions for quasi-linear equations of traffic flows»
We discuss a quasi-linear equation of traffic flow with fundamental diagram of Nagel-Schreckenberg. For this equation a Cauchy problem on the ring road is considered. We present a new result on the stability of solutions for this problem.

17:10: V. S. Dryuma (Institute of Mathematics and Computer Science, Moldova)
«On integration of the equations of flows of Incompressible liquids»
The Navier-Stokes and the Euler systems of equations are considered. An examples of non-singular solutions are constructed and their properties are discussed.

17:45 V. Chistyakov (National Research University of ITMO)
«On rotational dynamics of a rigid body around non-principal central axis under combined friction acting»
The dynamics is studied for rigid body rotating around fixed at Oz being central but not principal. Therefore the inertial torques Mx and My arise depending both on mass geometry Jx, Jy and on angular velocity w and acceleration ε. Dry friction acting on axis supports with coefficient δ leads to that the value of ε serves as the reason and result of the motion simultaneously. There were integrated numerically and/or analytically the dynamical equations of free and forced motion including rotational harmonic and inharmonic oscillations too. The results obtained are compared with those following from the standard linear equations.
The work is fulfilled within frames of the RBRF grant 16-08-00597 «Investigation of nonlinear multiple controlled mechanical systems by means of mathematical and computer modelling»