

**Czech–Japanese Seminar
in Applied Mathematics 2006**

held in Prague on September 14–16, 2006

organized by Czech Technical University in Prague,
Faculty of Nuclear Sciences and Physical Engineering,
and Institute of Thermomechanics,
Academy of Sciences of the Czech Republic

Scientific program

September 14, 2006

M. T. Nakao (Kyushu University Fukuoka, Japan)
Numerical verification of solutions for heat convection problems

Z. Jaňour (Czech Academy of Sciences, Prague)
Turbulence in the environmental flow

T. Ishiwata (Gifu University, Japan)
Finite difference schemes for Landau-Lifshitz equation

P. Guba (Comenius University, Bratislava, Slovakia)
Morphological instability of a pure material in a mixed phase

S. Omata (Kanazawa University, Japan)
Droplet motion with some contact angle

J. Plešek (Czech Academy of Sciences, Prague)
On the dispersion error of finite element meshes

D. Tagami (Kyushu University Fukuoka, Japan)
3-dimensional thermal convection computations in the glass production furnace

K. Ikeda (Tohoku University, Japan)
On a reaction-diffusion model for smolder patterns under micro-gravity

M. Kimura (Kyushu University Fukuoka, Japan)
Exponential decay of the first eigenvalue of an elliptic problem with large drift

September 15, 2006

T. Illangasekare (Colorado School of Mines, Golden, USA)
Challenges in the modeling the behavior of multiphase flow in naturally heterogeneous porous media

P. Frolkovič (Universität Heidelberg, Germany)
Flux-based level set method on unstructured grids

R. Shioya (Kyushu University Fukuoka, Japan)
Finite element analysis of 200 million DOF pressure vessel model with ADVEN-TURE system on the Earth Simulator

R. Holub (Colorado School of Mines, Golden, USA)
Why the classical nucleation theory (CNT) cannot work

K. Mikula (Slovak Technical University Bratislava, Slovakia)
Computational methods in image analysis

J. Tintěra (Institute for Clinical and Experimental Medicine, Prague)
Cardio MRI - dynamic examination of the heart hemodynamic functions

H. Kasai (Fukushima University, Japan)
Some gauge invariant estimates for Ginzburg-Landau equations

K. Švadlenka (Kanazawa University, Japan)
Volume-preserving motion

September 16, 2006

T. Nishida (University of Tokyo, Japan)
Extended fast marching method for the sail distance

S. Yazaki (University of Miyazaki, Japan)
Asymptotic behavior of solutions to an area-preserving motion by crystalline curvature

T. Ushijima (Tokyo University of Science, Japan)
A numerical method for Gauss curvature flow based on crystalline algorithm

F. Maršík (Czech Academy of Sciences, Prague)
Non-equilibrium thermodynamics conception of energy and mass transfer in living tissues and in fuel cells

H. Fujiwara (Kyoto University, Japan)
Application of multiple-precision arithmetic to numerically unstable problems

P. Knobloch (Charles University, Prague)
Extensions of the Mizukami-Hughes method for convection-diffusion equations

Y. Hiraoka (Hiroshima University)
Computer assisted analysis for the existence of home/heteroclinic orbits

T. Okuda (Osaka University, Japan)
Bifurcations for Turing's instability without $SO(2)$ symmetry

T. Nakaki (Hiroshima University, Japan)
Relaxation oscillation of seven point vortices

Posters

K. Barnhart (Colorado School of Mines, Golden, USA)
DNAPL flow in heterogeneous porous media - A multi-scale stochastic approach

P. Bauer (Czech Technical University in Prague)
Numerical simulation of air flow and pollution transport in the Atmospheric Boundary Layer

- L. Bednárik** (Czech Technical University in Prague)
Parallel algorithms for the Allen - Cahn equation
- P. Bednařík** (Czech Technical University in Prague)
Multifractal analysis with applications in fracture mechanics
- P. Beneš** (Czech Technical University in Prague)
Mathematical models of filtration convection problems in groundwater pollution
- S. Brand** (Czech Technical University in Prague)
Parallel algorithm for numerical solution of problems in fluid mechanics
- R. Chabiniok** (Institute for Clinical and Experimental Medicine, Prague)
Cardio MRI data segmentation using PDE of Allen-Cahn type
- O. Drblíková** (Slovak Technical University Bratislava, Slovakia)
Existence, uniqueness and $L_2(\Omega)$ a priori estimates for discrete solution of non-linear tensor diffusion in image processing
- Z. Fašková** (Slovak Technical University Bratislava, Slovakia)
Finite element method applied to the geodetic boundary value problem
- R. Fučík** (Czech Technical University in Prague)
Benchmark solutions for the two-phase porous-media flow
- P. Havlík** (Czech Technical University in Prague)
Comparison of several finite difference methods for magnetohydrodynamics in 1D and 2D
- R. Honzátko** (Czech Technical University in Prague)
Numerical solution of 2D flow over a vibrating profile
- T. Idogawa** (Shibaura Institute of Technology, Japan)
On solutions to a BVP related to Sobolev-Poincaré inequalities
- T. Kapin** (Czech Technical University in Prague)
Computer simulations of laser beam interaction with foams
- P. Louda** (Czech Technical University in Prague)
Numerical solution of unsteady flow using artificial compressibility method
- J. Mach** (Czech Technical University in Prague)
Application of degenerate diffusion algorithms of mathematical visualization
- J. Mikyška** (Czech Technical University in Prague)
Modelling multiphase flow in heterogeneous porous media
- V. Minárik** (Czech Technical University in Prague)
Numerical simulation of dislocation dynamics
- T. Oberhuber** (Czech Technical University in Prague)
On a numerical scheme for the Willmore flow

P. Pauš (Czech Technical University in Prague)

Computer analysis of fractal sets

P. Punčochářová (Czech Technical University in Prague)

Numerical solution of higher and lower Mach number flows

K. Seinerová (Czech Technical University in Prague)

Numerical solution of flows in Atmospheric Boundary Layer

P. Strachota (Czech Technical University in Prague)

Vector field visualization by means of anisotropic diffusion

R. Straka (Czech Technical University in Prague)

Mathematical model of coal combustion and NO_x production