

INTERNATIONAL CONFERENCE ON SCIENTIFIC COMPUTING

NANJING, CHINA

JUNE 4-8, 2005

Program

School of Mathematics and Computer Sciences

Nanjing Normal University

June 3: Registration and arrival

Place: Dinner Hall, NanShan Hotel (East Building)

- 6:30-7:30pm, dinner

June 4

Opening Ceremony Chair: Wenyu Sun (NNU)

Place: Main Conference Room in 3rd floor, NanShan Hotel

- 8:40-9:00, Opening remarks: Yongzhong Song (NNU), Zhongci Shi (CAS)

Morning First Session Chair: Zhilin Li

Place: Main Conference Room in 3rd floor, NanShan Hotel

- 9:00-9:50, Plenary Talk: Bjorn Engquist (UT Austin, USA)
Numerical analysis for singularities
- 9:50-10:40, conference photograph & coffee break

Morning Second Session Chair: Zhongci Shi (CAS)

Place: Main Conference Room in 3rd floor, NanShan Hotel

- 10:40-11:30, Plenary Talk, Weinan E (Princeton, USA)
Fundamental Issues in Multi-scale Modeling
- 11:30-12:20pm, Plenary Talk, Philippe Toint (Namur, Belgium)
A Recursive Trust-Region Method for Multi-Scale Unconstrained Minimization
- 12:20-2:00pm, lunch

Afternoon First Session

- 2:00-4:00pm, invited talks, 2 groups (30 minutes each)

Invited Talks: Optimization and Numerical Algebra group:

Place: 301 Tian Building, chair: Oleg Burdakov (Linkoping, Sweden)

2:00-2:30, Stefan Ulbrich (Technische Universität München Germany)
Recent Developments in PDE-Constrained Optimization

2:30-3:00, Shuzhong Zhang (Chinese U, Hong Kong)
Complex Quadratic Optimization and Semidefinite

3:00-3:30, Chengxian Xu (Xi'an Jiaotong U, China)
Continuation Methods for Max-Cut Problems

3:30-4:00, Zhenyue Zhang (Zhejiang U, China)
Necessary and sufficient conditions for the existence of positive definite solutions to the symmetric recursive inverse eigenvalue problem

Invited Talks: PDE Group:

Place: 309 Tian Building, chair: Ping Lin (NUS, Singapore)

2:00-2:30, Zhimin Zhang (WSU, US, Hunan Normal Univ., China)
Super-convergence Points in the Finite Element Method

2:30-3:00, Xiaolin Li (SUNY, USA)
Development of Front Tracking Method and its Applications to Scientific and Engineering Problems

3:00-3:30, Yuesheng Xu (Syracuse, USA)
Multi-parameter Regularization for Multi-scale Ill-posed Problems and Its Applications

3:30-4:00, Ning Zhao (NUAA, China)
Spectral volume methods by applying modified WENO reconstructions for hyperbolic conservation laws

4:00-4:30pm, coffee break

Afternoon Second Session

- 4:30-6:30pm, invited talks, 3 groups (30 minutes each)

Invited Talks: PDE/CFD & Application Group I:

Place: 309 Tian Building, Chair: Hailiang Liu (Iowa State, USA)

4:30-5:00, M-C. Lai (Jiao-Tong Univ., Taiwan)
Some efficient spectral/finite difference methods for solving elliptic equations on non-Cartesian geometries and their applications

5:00-5:30, Alina Chertock (NCSU, USA)

Conservative Locally Moving Mesh Method for Multi-fluid Flows

5:30-6:00, Xiaofan Li (IIT, USA)

A boundary element method for phase transformation in 3D

6:00-6:30, Ningning Yan (CAS, China)

Recovery Type a Posteriori Error Estimate

Invited Talks: PDE/CFD & Application Group II:

Place: 307 Tian Building, chair: Yuesheng Xue (Syracuse Univ.)

4:30-5:00, Xuecheng Tai (Norway)

A remark on the MBO scheme and some piecewise constant level set methods

5:00-5:30, Hien Tran (NCSU, USA)

Blood Pressure and Blood Flow Variation during Postural Change from Sitting to Standing: Model Development and Validation

5:30-6:00, Shaozhong Deng (ETU & UNCC, USA)

Numerical simulation of optical coupling by whispering gallery modes in coupled microcylinder optical waveguides

6:00-6:30, Jin Wang and Zhenyue Zhang (Zhejiang U, China)

Necessary and sufficient conditions for the existence of positive definite solutions to the symmetric recursive inverse eigenvalue problem

Invited Talks: PDE/CFD & Application Group III:

Place: 301 Tian Building, chair: Xiaolin Li (SUNY Stony Brook, USA)

4:30-5:00, Tiegang Liu (IHPC, Singapore)

On Accuracy of the Ghost Fluid Method Applied to Gas-Gas Riemann Problems

5:30-6:00, Chang Shu (NUS, Singapore)

Adaptive Mesh Refinement-enhanced Local DFD Method and Its Application to Solve Navier-Stokes Equations

6:00-6:30, Weijun Tang (IAPCM, China)

Numerical Research for Compressible Fluid Interface Instability

- 6:30-8:00pm Banquet

June 5

Morning First Session Chair: Tao Tang (HKBU)

Place: Main Conference Room in 3rd floor, NanShan Hotel

- 8:30-9:20, Plenary Talk, Thomas Banks (NCSU, USA)
Multi-scale Issues and Inverse Problems in Complex Materials
- 9:20-10:10, Plenary Talk, Thomas Y. Hou (Caltech, USA)
Multi-scale Analysis and Computation of 3D Incompressible Flow
- 10:10-10:40: **coffee break**

Morning Second Session Chair: Song Jiang (IAPCM)

Place: Main Conference Room in 3rd floor, NanShan Hotel

- 10:40-11:30 , Plenary Talk, Lisa Fauci (Tulane, USA)
Spirochetes and spermatozoa: Fluid dynamic models of microorganism motility
- 11:30-12:20 , Plenary Talk, Qiang Du (PSU, USA)
Centroidal Voronoi Tessellation (CVT): new algorithms and applications
- 12:20 -2:00pm, **lunch**

Afternoon First Session

- 2:00-4:00pm

Invited Talks: Optimization and Numerical Algebra group:

Place: 301 Tian Building, chair: Shuzhong Zhang (Chinese U, Hong Kong)

2:00-2:30, Yayan Lu (City U, Hong Kong)
Iterative Methods for Waveguide Discontinuity Problems

2:30-3:00, Bingsheng He (Nanjing University, China)
Implicit complementarity problems "C Applications and Algorithms

3:00-3:30, Chuangying Dang (City U, Hong Kong)
Triangulations and Applications in Simplicial Methods for Optimization

3:30-4:00, Yunqiu Shen (Western Washington University, USA)
Solving Rank-Deficient Separable Nonlinear Equations

Invited Talks: PDE/CFD & Applications Group

Place: 309 Tian Building, Chair: Zhimin Zhang (Wayne State & Hunan Normal Univ.)

2:00-2:30, Jie Shen (Pudue, USA)

*A phase-field model for the mixtures of two incompressible fluids:
applications to drop formation*

2:30-3:00, Ping Lin (NUS, Singapore)

*Simulation of Singularity Dynamics for Liquid Crystal Flows: A C^0
Finite Element Methods*

3:00-3:30, Hailiang Liu (Iowa State University, USA)

*Computing multi-valued physical observables for the high frequency limit
of symmetric hyperbolic systems*

3:30-4:00, Weimin Han (University of Iowa, USA)

*Quasistative variational inequalities: Theory, numerical solution and
applications in mechanics*

4:00-4:30pm, **coffee break**

Afternoon Second Session

- 4:30-6:30pm, contributed talks, 3 groups (15 minutes each)

Contributed Talks: Group I:

Place: 309 Tian Building, chair: Xiaofan Li (IIT, USA)

4:30-4:45, C.-S. Chien (Southern Taiwan University of Technology, China)

*A new implementation of the two-grid method for the numerical solutions the
Schrodinger-Poisson system*

4:45-5:00, Eng Choo (Simon Fraser University)

*Simple Heuristics for deteriorating them with time varying demand
and shortages*

5:00-5:15, Nitima Ascharyaphotha (KMUTT)

To Prepare Initial Conditions of Numerical Ocean Modeling for the Gulf of Thailand with Interpolation

5:15-5:30, Hong Chen (Tongji University, China)

Numerical simulation of flow around two 2D circular cylinders in tandem arrangement

5:30-5:45, 5:30-5:45, Hongji Chen (Inst. of Engin. Thermophysics, CAS)

On issues concerning the accuracy of the second order accurate TVD schemes

5:45-6:00, Huicong Ye, Suqin Chen (Tongji University, China)

Numerical simulation of aerodynamic force for flow around a square cylinder in 2-D domain

6:00-6:15, Joel Chavoya (ITSZ, Mexico)

How to find mechanical rigid body properties using a computer vision algorithm

Contributed Talks: Group II:

Place: 307 Tian Building, chair: Alina Chertock (NCSU, USA)

4:30-4:45, J-E. Yang, (CAS, China)

Domain decomposition with Non-matching grids for coupling of FEM and BEM

4:45-5:00, Usa Humphries (King Mongkut's University Of Technology honburi)

Increase resolution of numerical primitive equation ocean model applied to flow in the faroe bank channel

5:00-5:15, Manuel Torrilhon (Hong Kong University of Science and Technology, China)

Numerical Solution of Regularized Moment Equations

5:15-5:30, William Kwabena Kyei (University of Cape Coast)

TBA

5:30-5:45, Gashaw Aychiluhim (Hohai University, China)

Application of Nonparametric Mathematical Statistics in Water Quality Trend Analysis

5:45-6:00, Anirut Luadsong (King Mongkut's University of Technology Thonburi)

The Fractional Steps Method for 2D-DMBVP

6:00-6:15, Sheng Zhang (Chinese Academy of Science, China)
On Preconditioning the Coupling System of Natural Boundary Element Method and Finite Element Method for Unbounded Domain Problem

6:15-6:30, Zhengru Zhang (Beijing Normal University, China)
TBA

Contributed Talks: Group III:

Place: 301 Tian Building, chair: Maijian Qian (Cal-State, USA)

4:30-4:45, Leonardo Traversoni (Universidad Autonoma Metropolitana)
TBA

4:45-5:00, Weiyang Zheng (Academy of Mathematics and System Sciences, CAS)
Adaptive finite element time-domain method for eddy current problems

5:00-5:15, Maricela Hernandez (Universidad Autonoma Metropolitana)
TBA

5:15-5:30, Chi-Tien Lin (Providence University, Taiwan)
On Central-Upwind Schemes for hyperbolic Conservation Laws

5:30-5:45, Xiaomei Ji (BJUT, China)
An insidious shock formulation in a rarefactive Riemann problem for 2D compressible Euler equations

5:45-6:00, Guohua Zhou (Clarkson University)
Design and Experiment Multigrid Solvers on Spherical Geodesic Grids

6:00-6:15, Cheng Wang (Tongji University, China)
Two-grid P_1 nonconforming finite element method for second order elliptic problems

6:15-6:30, Haijun Wu (Nanjing University)
Convergence analysis of the PML problems for time-harmonic Maxwell's equations

- 6:30-8:00pm, dinner

June 6, Half day conference

Morning First Session Chair: Qiang Du (PSU, USA)

Place: Main Meeting Room in 3rd floor, NanShan Hotel

- 8:30-9:20AM, Plenary Talk, Eitan Tadmor (Maryland, USA)
Detection of Edges and High Resolution Reconstruction of Piecewise Smooth Solutions
- 9:20-10:10, Plenary Talk, Pingwen Zhang (PKU, China)
The Structure and Stability of Stationary Solutions of Onsager Equation
- 10:10-10:40: **coffee break**

Morning Second Session Chair: J. Stoer (Wurzburg, Germany)

Place: Main Meeting Room in 3rd floor, NanShan Hotel

- 10:40-11:30, Plenary Talk, Uri M. Ascher (UBC, Canada)
On effective methods for implicit piecewise smooth surface recovery
- 11:30-12:20, Plenary Talk, Masao Fukushima (Kyoto Univ. Japan)
A Matrix Splitting Method for Symmetric Affine Second-Order Cone Complementarity Problems
- 12:20-2:00 **lunch**

Afternoon: 2:00-7:00, Half-day guided city tour

- 7:00-8:30pm, Dinner at Fu-Zi (Confucius) temple

June 7, Nanjing University conference site

- 8:30-9:00, pick up from individual hotels

Lecture Hall in Level 2, Meng Min Wei Building, Nanjing University

- 9:00-9:10, **Ceremony of honorary professorship of Stan Osher and Chi-Wang Shu at Nanjing University**

Morning First Session Chair: Chi-Wang Shu (Brown, USA)

- 9:10-10:00, Plenary Talk, Stanley J. Osher (UCLA, USA)
Bregman iteration and the dual of BV in inverse problems in imaging and Elsewhere

- 10:00-10:50, Plenary Talk, Tao Tang (BU, Hong Kong)
Moving Mesh Method for Computational Fluid Dynamics
- 10:50-11:20: **coffee break**

Morning Second Session Chair: Bengsheng He (NU, China)

- 11:20-12:10, Plenary Talk, Hermann Brunner (Newfoundland, Canada)
High-order collocation methods for systems of weakly singular Volterra functional integro-differential equations of neutral type
- 12:10 -2:00, **lunch**

Afternoon First Session

- 2:00-4:00pm, invited talks, 2 groups (30 minutes each)

Invited Talks: Optimization and Numerical Algebra group:

Lecture Room, Department of mathematics, NU, chair: Masao Fukushima (Kyoto Univ. Japan)

- 2:00-2:30, J. Stoer (Wuerzburg, U, Germany)
Minimizing strictly convex quadratic functions on the convex hull of a large point set
- 2:30-3:00, Maijian Qian (Cal-State, USA)
The Developments on Proximal Point Algorithm for Monotone Operators
- 3:00-3:30, Oliver Stein (University of Duisburg-Essen, Germany)
Design centering from a new point of view
- 3:30-4:00, Yiming Wei (Fudan U, China)
New Condition Numbers for Generalized Matrix Inversion and Linear Least Squares Problem

Invited Talks: PDE/CFD & Applications Group:

Room 1105, Meng Min Wei Building, chair: Hongkai Zhao (UCI, USA) & Zhimin Zhang (WSU, USA)

- 2:00-2:30, Kazufumi Ito (NCSU, USA)
Preconditioned Iterative Methods on Sparse Subspaces
- 2:30-3:00, Jianping Zhu (Akron, USA)
An Efficient Fourth-order Algorithm for Reaction-Diffusion

Equations with Neumann Boundary Conditions

3:00-3:30, Andreas Wiegmann (Fraunhofer Society, Germany)

Fast iterative solvers for virtual material design

3:30-4:00, Khoo Boo Cheong (NUS, Singapore)

Simulation of Homogeneous Unsteady Cavitation in Multidimensional Flow

- 4:00-4:30pm, coffee break

Afternoon Second Session

- 4:30-6:30, invited talks, 3 groups(30 minutes each)

Invited Talks: Optimization and Numerical Algebra group:

**Lecture Room, Department of mathematics, NU, chair: Stefan Ulbrich
(Technische Universität München Germany)**

4:30-5:00, Defeng Sun (NUS, Singapore)

A dual optimization approach to inverse quadratic eigenvalue problems with partial eigenstructure

5:00-5:30, Ziping Huang (Tongji Univ., China)

Numerical Simulation of the Seismic Wave Propagation with Perfectly Matched Layer Absorbing Condition

5:30-6:00, Huifu Xu (University of Southampton, UK)

Convergence Analysis of Sample Average Approximation Methods for a Class of stochastic Mathematical Programs with Equality Constraints

6:00-6:30, Chong Li (Zhejiang U, China)

Strong CHIP for Infinite System of Closed Convex Sets in Normed Linear Spaces

Invited Talks: PDE/CFD & Application Group I:

Room 1104, Meng Min Wei Building, chair: Kazufumi Ito (NCSU, USA)

4:30-5:00, Weizhu Bao (NUS, Singapore)

Numerical Simulation for Rotating Bose-Einstein Condensate

5:00-5:30, Alexander Kurganov (Tulane, USA)

Central-Upwind Schemes for Balance Laws. Applications to Multifluid and Multiphase Computations

5:30-6:00, Huaxiong Huang (York, Canada)

Optimal Control Problems from Finance and Engineering Applications

6:00-6:30, Guangwei Yuan (IAPCM, China)

*Parallel Iterative Difference Schemes Based on Interface Correction for
Sn Transport Method*

Invited Talks: PDE/CFD & Application Group II:

Room 1105, Meng Min Wei Building, chair: Jianping Zhu (Akron, USA)

4:30-5:00, Yang Xiang (HKUST, Hong Kong)

Numerical simulations of dislocation dynamics using level set method

5:00-5:30, John Stockie (Simon Fraser University, Canada)

Simulation of Transport Processes in PEM Fuel Cells

5:30-6:00, Xiaonan Wu (HKBU)

*A two step finite difference method for two dimensional option pricing
problems*

6:00-6:30, Tiejun Li (Peking U, China)

*Convergence analysis of BCF methods for high dimensional Hookean
dumbbell model*

- 6:30-8:00 Dinner

June 8

Morning First Session Chair: Xiaolin Li (SUNY Stony Brook)

Place: Main Meeting Room in 3rd floor, NanShan Hotel

- 8:30-9:20am, Plenary Talk, Tony F. Chan (UCLA, USA)
Conformal Brain Mapping with Variational Methods and PDEs
- 9:20-10:10, Plenary Talk, Chi-Wang Shu (Brown, USA)
Recent Development on Discontinuous Galerkin Methods
- 10:10-10:40: **coffee break**

Morning Second Session Chair: Philippe Toint (Namur, Belgium)

Place: Main Meeting Room in 3rd floor, NanShan Hotel

- 10:40-11:20 , Plenary Talk, Oleg Burdakov (Linkoping, Sweden)
Fast Optimization Algorithms for Problems with Monotonicity Constraints
- **11:30-1:00 lunch**

Afternoon First Session:

1:00-2:30pm, invited talks, 2 groups (30 minutes each)

Invited Talks: group I:

Place: 307 Tian Building, chair: Yimin Wei (Fudan Univ., China)

1:00-1:30, Jianguo Huang (Shanghai JiaoTong University)
Vibration analysis of Kirchhoff plates by the lumped mass Morley element method

1:30-2:00, Jin-Lu Li (Shawnee State Univ. USA)
The Generalized Projection and the Metric Projection Operators and Their Applications to Variational Inequalities in Banach Spaces

Invited Talks: Group II:

Place: 309 Tian Building, chair: Andreas Weigaman (Germany)

1:00-1:30, Jianguo Liu (Maryland, USA)
Novel Finite Element Navier-Stokes Solvers

1:30-2:00, Jianxian Qiu, (Nanjing University, China)
WENO limiters for Runge-Kutta discontinuous Galerkin methods

- **2:00-2:30pm, coffee break**

Afternoon Second Session:

- 2:30-5:30pm, contributed talks, 3 groups (15 minutes each)

Contributed Talks: Group I:

Place: 301 Tian Building, chair: Yingjie Liu, (Gatech, USA)

2:30-2:45, Xionghua Wu, Chen Li, Wenbin Kong (Tongji University, China)
Treatment of boundary conditions and exponential convergence for Sinc collocation method

2:45-3:00, Yulong Xing (Brown Univ. USA)
High order well balanced schemes for a class of hyperbolic balance laws

3:00-3:15, Long (Larry) Wang, (Southern Polytechnic State University, USA)
White Noise Hypothesis for MSE of PCM quantization schemes

3:15-3:30, Jie Li (University of Cambridge, UK)
The development of asymmetry for oscillatory flow in a tube containing sharp periodic baffles

3:30-3:45, Yingjie Liu, (Gatech, USA)
Back and Forth Error Compensation and Correction Methods for Semi-Lagrangian Schemes with Application to Interface Computation Using Level Set Method

3:45-4:00, Daning Chen (Jackson State, USA)
Image Recovering Using the Method of Shape from Shading

4:00-4:15, Wei Xu (McMaster Univ., Canada)
A divide and conquer method for symmetric singular value decomposition

4:15-4:30, Songtao Liu (Syracuse University)
Galerkin methods based on Hermite splines for singular perturbation problems

4:30-5:00, Xiaoqing Jin (U. of Macao, China)

Stability property of T. Chan's pre-conditioner

5:00-5:15, Jing Xu (TianJin Polytechnic University)
*Gradient Recovery Type A Posteriori Error Estimate for Nonconforming
Finite Element Approximation*

5:15-5:30, Hui Zhang (Beijing Normal University, China)
Phase transition in rigid rod-like polymes

Contributed Talks: Group II:

Place: 307 Tian Building, chair: Jianxian Qiu (NU, China)

2:30-2:45, Yunxian Liu (SDU, China)
*Local discontinuous Galerkin methods for semiconductor device simulation
models*

2:45-3:00, Jeff Chak Fu (Chinese University of Hong Kong, China)
*Numerical simulation of two-dimensional laminar mixed-convection in a
lid-driven cavity using the mixed finite element consistent splitting scheme:
influence of Richardson numbers*

3:00-3:15, Xiezhong Li (Georgia Southern University)
*Spectral properties of row stochastic Leslie matrices with a near-periodic
fecundity pattern .*

3:15-3:30, Juan Cheng, (IAPCM, China)
*A second order accurate conservative ENO remapping method on
staggered meshes*

3:30-3:45, Chunguang Li, Hefang Jin (The Second Northwest Univ. for Nationalities)
*A Third Order Hybrid Finite Difference Scheme for Convection-diffusion
Problems*

3:45-4:00, Linxiang Wang (University of Southern Denmark)
*A Low Dimensional Model For Shape Memory Alloys Patches With
Phase Transformations*

4:00-4:15, Lan-Xiang Wang, (Second Northwest Multi-culture Univ., China)
TDMA and its application in CFD

4:15-4:30, Wen-feng Pan (Shanghai Jiaotong University, China)
*Far-field pattern and inverse scattering problem for a penetrable obstacle
in an ocean waveguide*

4:30-4:45, Jing Han (Tianjin Polytechnic University, China)
TBA

4:45-5:00, Jinhua Wang (Zhejiang Univ., China)
Newton methods on Riemann manifold

5:00-5:15, Guodong Ye (Shantou university, China)
*Spectral properties of row-stochastic Leslie matrix with a near-periodic
Fecundity pattern*

- **5:30-6:30pm, dinner and fareware**

June 9

- Departure.
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