

CoMFoS16: Mathematical Analysis of Continuum Mechanics and Industrial Applications II

開催時期 2016-10-22 09:25~2016-10-24 16:00

場所 九州大学 西新プラザ 大会議室AB

16th International Conference

CoMFoS16: Mathematical Analysis of Continuum Mechanics and Industrial Applications II

URL:<https://sites.google.com/site/comfos16/>

※ この研究集会はマス・フォア・インダストリ研究所 共同利用研究の公開プログラムです。

Keywords:

Continuum mechanics, Fracture mechanics, Mathematical modeling, Industrial applications

Aim and Scope:

This is a three-day international conference on mathematical aspects of continuum mechanics for solids. It is the sequel of last year's CoMFoS15 workshop. We aim to discuss about the advancements of the topics in CoMFoS15 and bring forth new research topics. The intended audience are experts from fields ranging from mathematics and physics to engineering and industry. We focus on mathematical theory and numerical simulations related to topics such as fracture mechanics, elasticity, plasticity, scattering, inverse problem and optimal shape design. These topics have become more important in engineering and industry, and a deeper understanding of their mathematical properties is required for future applications. We especially invite distinguished researchers from mathematics, physics, engineering, and industry. There will be various kinds of lectures including the special lectures by the keynote speakers of the conference.

Expected Outcome:

Each lecture is followed by enough discussion time, during which we expect the following outcomes on the above topics among the participants from mathematics, physics, engineering and industry:

- finding new mathematical research directions in continuum mechanics from the viewpoints from engineering and industrial requirements,
- Investigating future applications in industry and engineering inspired from the theoretical results presented from mathematicians, physicists and theoretical engineers in the conference.

History of CoMFoS and MACM:

The conference series "CoMFoS" started at 1995 and has been organized by the activity group 'Continuum Mechanics Focusing on Singularities (CoMFoS)' in The Japan Society for Industrial and Applied Mathematics (JSIAM). From April 2010, the activity group CoMFoS was renamed 'Mathematical Aspects of Continuum Mechanics (MACM)'. The 16th conference of CoMFoS is held as the IMI Workshop

of the Joint Research Projects supported by Institute of Mathematics for Industry, Kyushu University.

CoMFoS started as a research community of applied mathematicians and engineers working mainly on solid continuum mechanics and fracture mechanics. At present, it gathers not only mathematicians and engineers but also researchers in physics and industry who discuss mathematical aspects of continuum mechanics related to wider topics including

- fracture and damage mechanics,
- elasticity and plasticity,
- shape optimization,
- scattering and inverse problems,
- fluid-structure interaction,
- particle methods,
- soft matter.

開催期間 2016年10月22日(土) ~ 10月24日(月)

開催場所 〒814-0002 福岡市早良区西新2-16-23
九州大学 西新プラザ 大会議室AB

【プログラム】 (全33講演)

Keynote talks: 40 min (30 min talk + 10 min discussion)

Invited talks: 25 min (20 min talk + 5 min discussion)

10月22日(土)

9:25 -

9:30 *Opening address*

9:30 - Adrian Muntean (Karlstads Universitet, Karlstad, Sweden)

10:10 *Reaction-diffusion systems with distributed microstructures: well-posedness, homogenization asymptotics, multiscale feedback estimates I*

10:10 Takeshi Takaishi (Hiroshima Kokusai Gakuin University)

- *Numerical simulation of crack growth of Maxwell fluid*

10:35

10:35 Sayako Hirobe (Keio University)

- *Mathematical modeling of the desiccation cracking*

11:00

11:00

- Coffee Break

11:20

11:20 Maria Lukacova (University of Mainz, Mainz, Germany)

- *Asymptotic preserving IMEX schemes for weakly compressible fluids*

12:00

12:00 Hana Mizerova (University of Mainz, Mainz, Germany)

- *Numerical analysis and solution of a viscoelastic fluid flow model*

12:25

12:25

- Lunch Break

14:00

- 14:00 Nadia Ansini (La Sapienza, Rome, Italy)
 - *Minimising movements for oscillating energies: the critical regime*
- 14:40
- 14:40 Ryohei Seto (Okinawa Institute of Science and Technology Graduate
 - University)
- 15:05 *Nonuniform flow of shear thickening suspensions in widegap rotary
 Couette geometry*
- 15:05 Daisuke Tagami (Institute of Math-for-Industry, Kyushu University)
 - *An application of characteristic methods into a generalized particle
 15:30 method for convection-diffusion equations*
- 15:30
 - Coffee Break
- 15:50
- 15:50 Naoshi Nishimura (Kyoto University)
 - *Discretisation of electric field integral equation with Hdiv inner products*
- 16:30
- 16:30 Hiroshi Kanayama (Japan Women's University)
 - *Balancing domain decomposition (BDD) related preconditioners in
 16:55 engineering including magnetostatic problems*
- 16:55
 - Coffee Break
- 17:15
- 17:15 Shiro Tsukamoto (National Institute of Technology, Anan College)
 - *Crystal growth mechanism of compound semiconductor quantum dots*
- 17:55
- 17:55 Tomoya Konishi (National Institute of Technology, Anan College)
 - *Spatial point process and Hopkins-Skellam index of InAs quantum dot
 18:20 formation on GaAs(001)*
- 19:30
 - Banquet

10月23日(日)

- 9:30 - Marita Thomas (Weierstrass Institute, Berlin, Germany)
- 10:10 *Energetic concepts for coupled rate-independent and rate-dependent
 processes: Damage & delamination in visco-elastodynamics I*
- 10:10 Indra Vir Singh (Indian Institute of Technology Roorkee, India)
 - *Numerical simulation of fracture mechanics problems by extended
 10:35 isogeometric analysis*
- 10:35
 - Akhilendra Singh (Indian Institute of Technology Patna, India)
 - *Crack growth simulations by extended finite element method*
- 11:00
- 11:00
 - Coffee Break
- 11:20
- 11:20 Adrian Muntean (Karlstads Universitet, Karlstad, Sweden)
 - *Reaction-diffusion systems with distributed microstructures: well-*

- 12:00 *posedness, homogenization asymptotics, multiscale feedback estimates II*
- 12:00 Amy Shen (Okinawa Institute of Science and Technology Graduate
- University)
- 12:25 *Flow of wormlike micellar solutions around confined microfluidic cylinders*
- 12:25
- Lunch Break
- 14:00
- 14:00 Eliot Fried (Okinawa Institute of Science and Technology Graduate
- University)
- 14:40 *Geometric variational problems involving competition between line and
surface energy*
- 14:40
- Karel Svadlenka (Graduate School of Science, Kyoto University)
- 15:05 *Applications of thresholding methods for interface motion*
- 15:05 Elliott Ginder (Hokkaido University)
- *Modeling of interfacial active matter: a line mass approach*
- 15:30
- 15:30
- Coffee Break
- 15:50
- 15:50 Shiro Hirano (Ritsumeikan University)
- *Integral representation and its applications of the mechanics of
earthquakes*
- 16:30
- 16:30 Ryosuke Ando (University of Tokyo)
- *Application of dynamic earthquake rupture simulation to the 2016
Kumamoto earthquake*
- 16:55
- 16:55
- Coffee Break
- 17:15
- 17:15 Marco Morandotti (SISSA, Trieste, Italy)
- *Structured deformations of continua: theory and applications*
- 17:55
- 17:55 Patrick van Meurs (Kanazawa University)
- *Self-organisation of non-locally interacting particles at boundaries*
- 18:20
- 19:30 Informal dinner
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10月24日(月)

- 9:00 - Akira Takada (Asahi Glass Company)
- 9:40 *Structural disorder in materials and time's arrow*
- 9:40 - Hirotsada Honda (NTT Network Technology Laboratories)
- 10:20 *On mathematical modeling and analysis of brain network*
- 10:20 - Coffee Break
- 10:40
- 10:40 - Marita Thomas (Weierstrass Institute, Berlin, Germany)

11:20 *Energetic concepts for coupled rate-independent and rate-dependent processes: Damage & delamination in visco-elastodynamics II*
11:20 - Shingo Urata (Asahi Glass Company)
11:45 *Multiscale modeling for glass fracture*
11:45 - Tetsuo Yamaguchi (Kyushu University, Japan)
12:10 *Monitoring and prediction of catastrophic mechanical phenomena*
12:10 - Lunch Break
13:40
13:40 - Takumi Washio (The University of Tokyo)
14:20 *Continuum mechanical modeling of cardiac muscle*
14:20 - Takashi Nakazawa (Tohoku University)
14:45 *Shape optimization problem of flow fields toward turbulent control*
14:45 - Coffee Break
15:05
15:05 - Hideyuki Azegami (Nagoya University)
15:30 *Second derivative of cost function and H1 Newton method in shape optimization problem*
15:30 - Kohji Ohtsuka (Hiroshima Kokusai Gakuin University)
15:55 *Shape optimization of set of singular points in boundary value problems*
15:55 - Closing
16:00

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