



COMPSAFE 2025

1st-4th July 2025

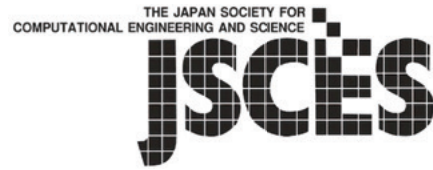
Kobe International Conference Center,
Kobe, JAPAN



Hosting Organizations



Japan Association for Computational
Mechanics



The Japan Society for Computational
Engineering and Science

Supporting Organizations



Asian Pacific Association for
Computational Mechanics



International Association for
Computational Mechanics



Kobe University



National Research Institute for Earth
Science and Disaster Resilience



RIKEN Center for Computational Science (R-CCS)



University of Hyogo



CONFERENCE CHAIRS

Makoto Tsubokura

Kobe University/ RIKEN R-CCS

Dear Colleagues and Participants,

On behalf of the Organizing Committee, it is my great pleasure and honor to welcome you to the 4th International Conference on Computational Engineering and Science for Safety and Environmental Problems (COMPSAFE2025), held from July 1st to 4th, 2025, at the Kobe International Conference Center.

COMPSAFE first began in April 2014 in Sendai, Japan, followed by the second conference in Chengdu, China, in October 2017. The third conference was originally scheduled to be held in Kobe, but due to the COVID-19 pandemic, it was conducted entirely online in December 2020. We are now delighted to finally hold this long-awaited fourth edition in person here in Kobe.

This year, COMPSAFE2025 is proudly organized as both an APACM Thematic Conference and an IACM Special Interest Conference, underscoring its important role in the international community of computational engineering and mechanics.

We are pleased to welcome over 350 registered participants from around the world. The technical program features more than 300 presentations, mainly from Asia, distributed across up to 13 parallel sessions. Furthermore, we are honored to host three Plenary Lectures and thirteen Semi-Plenary Lectures by distinguished researchers who are at the forefront of this field. These talks will offer valuable insights into cutting-edge research and future directions in computational approaches to safety and environmental challenges.

Kobe is a city closely connected to the theme of this conference. In January 1995, the city was struck by the Great Hanshin-Awaji Earthquake, which caused devastating damage. Since then, Kobe has become a symbol of recovery and resilience, with continuous efforts in disaster preparedness and safety innovation. It is, therefore, an ideal setting for a conference dedicated to advancing computational technologies for safety and environmental problem-solving.

Surrounded by both mountains and the sea, Kobe offers a beautiful natural setting and a culturally rich atmosphere. Since opening to the world as a port city in the 19th century—alongside Yokohama—Kobe has flourished as an international hub with a unique blend of tradition and modernity. The city is also known for its world-class cuisine, including the famous Kobe beef, which we hope you will enjoy during your stay.

I sincerely hope that COMPSAFE2025 will be an intellectually stimulating and rewarding experience for all of you, and that your time in Kobe will be both enjoyable and memorable.

We look forward to engaging discussions, new collaborations, and shared visions for a safer and more sustainable future.

Toshio Nagashima
The president of JSCES



Dear Participants,

We are honored to co-host COMPSAFE2025 with the Japan Association for Computational Mechanics (JACM).

We are grateful to all of you who have come from all over the world to participate in this conference, which is being held here in Kobe, Japan.

COMPSAFE is an international academic conference on using computational mechanics and engineering to contribute to realizing a safe and secure society. I feel it is significant that we have the opportunity to bring together people who are active at the forefront of various fields to share knowledge and deepen discussions on such an important theme.

The Japan Society of Computational Engineering and Science (JSCES), of which I am the president, is an academic organization in Japan where researchers in computational engineering from industry and academia are active. It will celebrate its 30th anniversary in 2025. Many members will participate in this conference, presenting their research results and/or listening to lectures.

I would like to express my deepest gratitude to the members of the international advisory committee, the local organizing committee, the local arrangements committee, the supporting organizations, and all those involved in making this conference possible, and I sincerely hope that all participants will have a fruitful experience.

Seiya Hagihara

The president of JACM



Dear Participants,

We are pleased to welcome you to the 4th International Conference on Computational Engineering and Science for Safety and Environmental Issues (COMPSAFE 2025), to be held in Kobe in Japan. We are honored to co-host COMPSAFE2025 with The Japan Society for Computational Engineering and Science (JSCES).

I am the president of the Japan Association for Computational Mechanics (JACM), an APACM member society and IACM affiliated society. On behalf of all the individual members of the JACM and 29 JACM affiliated computational mechanics societies in Japan, I would like to welcome all of you to Kobe Japan.

First, I would like to thank you all for your participations in COMPSAFE 2025. I would also like to thank Professor Makoto Tsubokura and the organizing committee members.

The JACM was established on December 17, 2002 and, as stated in the statutes, is an affiliated society of IACM (International Association for Computational Mechanics). The JACM is a kind of umbrella organizations independent of the domestic academic societies. 39 GC members were elected from 29 computational mechanics-related societies in Japan. JACM has brought the 29 societies together and has connected them with IACM and APACM activities.

It is hoped that more members of the national societies will continue to participate more actively in IACM and APACM-related international conferences such as COMPSAFE2025. I would like to hope you to obtain new discoveries and knowledges during the conference that will lead us to safety and security.

I am looking forward to seeing you at the future IACM and APACM-related international conferences.



Plenary Lectures

Prof. **YuanTong Gu** (Queensland University of Technology)

Physics-informed Machine Learning: a powerful computer modelling framework for engineering and science

In recent years, physics-informed neural networks (PINNs) have revolutionized the application of machine learning to solving partial differential equations (PDEs). By combining data-driven and physics-based models, PINNs retain the strengths of both approaches, showing exceptional potential in addressing a wide range of complex problems. As a result, they have garnered increasing attention in many applications, particularly for problems with strong nonlinearities. The PINN has been becoming a game-changer for computer modelling and simulation for engineering and science.

This talk will first review the latest advancements in the use of PINNs for mechanics, including solid mechanics, nonlinear mechanics, fracture analysis, structural optimization, fluid mechanics, and more. Next, the challenges in applying PINNs to mechanics will be discussed. Finally, recent research from the speaker's group will be presented, covering topics such as the new neural network architecture in PINN for mechanics, PINN-based structural topology optimization, food drying modelling, dynamic and nonlinear problem solving, and inverse problems. It has proven that physics-informed machine learning will be the new generation of a computer modelling framework for mechanics.



Prof. **Jung-Wuk Hong** (Korea Advanced Institute of Science and Technology)

Recent Advances in Nonlocal Methods for Computational Mechanics

This plenary talk presents recent advancements in nonlocal methods for computational mechanics, emphasizing their pivotal role in addressing challenges such as fracture, damage, and multiscale interactions in which classical continuum-based methodologies often encounter limitations. Nonlocal methods, which incorporate interactions within a specific range, provide a robust alternative by capturing complex behaviors in materials with discontinuities and intricate microstructures. The talk begins with an overview of current nonlocal approaches classified as either mesh-based or meshless nonlocal methods and then focuses on the peridynamics as one of the notable recent methodologies. Peridynamics provides an innovative framework for simulating damage and fracture mechanics without reliance on traditional differential operators, enabling more accurate modeling of damage and discontinuities. By exploring the latest developments in peridynamic theory and its applications across engineering fields, this talk aims to inspire further advances in computational mechanics, particularly in nonlocal methodologies.



Prof. **Michael Kaliske** (Technische Universität Dresden)

Theoretical-numerical Approaches to Damage and Fracture Analysis of Structures

The design of resilient structures depends on a comprehensive understanding of structural behavior through realistic models of material damage, fracture processes, and failure to evaluate complex load scenarios, optimize repair intervals, and predict remaining lifetimes. This plenary talk explores key aspects of nonlocal damage models applied to multiaxial loading scenarios, emphasizing the mechanisms of induced anisotropy, which is inherent in concrete. Applications to discretization techniques, including the Finite Element Method (FEM) and the Material Point Method (MPM), illustrate the versatility and integration of these material models across different computational frameworks.



Another focus is on recent energy-based fracture formulations, discussing their potential in addressing complex fracture processes such as crack branching, multi-physical couplings, and impact loads. Additionally, we introduce an algorithm for calculating effective limit criteria for composites and multiscale materials. Its computational efficiency enables the exploration of the structural design space and facilitates structural optimization. The presented models and frameworks are demonstrated through diverse examples, spanning concrete structures, wooden artwork, pavement systems, and glass components.

Semi-Plenary Lectures

Prof. **Leszek Demkowicz** (The University of Texas at Austin)

DPG Method on a New Road to Nonlinear Problems

2025 marks the 16th anniversary of our first foundational papers on the Discontinuous Petrov- Galerkin method with Optimal Test Functions, in short the DPG method. In the talk, I will attempt to present DPG fundamentals for linear problems illustrated with a few numerical examples, and an outlook at the generalization of the DPG methodology to nonlinear problems represented by a nonlinear elasticity problem.



Prof. **Tsuyoshi Ichimura** (The University of Tokyo)

Earthquake simulation enhanced by high-performance computational science

With the accumulation of measurement data, there is an increasing need for analysis using high fidelity models. The huge analysis cost associated with these models is a common problem in many fields. Such analysis will often not be possible simply by using conventional methods and a supercomputer, so there is a need to develop computer architecture-aware algorithms that can take advantage of massively parallel supercomputers. On the other hand, the integration with data science (e.g. neural networks) is being promoted to improve the efficiency of analysis, but accuracy assurance is often an issue. This talk will present recent computational science algorithms with high performance computing (including integrated algorithms with data science that can guarantee accuracy to further improve the efficiency of analysis) that are suitable for modern computer systems/architectures to efficiently solve large-scale nonlinear/linear, dynamic/static problems. This presentation will show implementations using the finite element method with an application example for earthquake problems, but it is expected to be applied and extended to other similar problems.



Prof. **Kiao Inthavong** (RMIT University)

Revealing respiratory physiology defence of inhaled airborne particles through multiphase flow simulations

The respiratory system is a remarkable structure with complex physiological functions that sustain life autonomously by delivering oxygen to the body and expelling carbon dioxide. On average, a person takes about 20,000 to 25,000 breaths per day, equating to approximately 10,000 to 12,500 liters of air. Hidden within this system are evolutionary anatomical features that serve as defense mechanisms, protecting us from airborne pollutants and viruses. Recent advancements in radiology have enabled multiphase flow simulations within computational fluid dynamics (CFD) for respiratory models. In this talk, I will present recent simulation outcomes that reveal the intricate and evolutionary adaptations of the airways that serve to protect us. This includes an analysis of the risks associated with exposure to airborne pollutants such as pollen, silica, asbestos, and viruses (e.g., COVID-19). Furthermore, I will explain how certain sub-anatomies serve extended, hidden functions in addition to their traditional roles—for instance, the larynx does more than just enable vocalization. The talk will also explore how the airway's shape can be leveraged to enhance drug delivery, offering new strategies to combat systemic diseases. Finally, the talk will conclude with future work that aims to enable instant diagnosis directly from a visit to the radiology center.



Prof. **Artem Korobenko** (University of Calgary)

Advances in Variational Multiscale Methods for Optimizing Wind and Marine Energy Systems

Accelerating the deployment and scientific advancement of wind and marine energy systems requires the development of predictive multi-fidelity numerical tools integrated into their design, operation, and management. In this talk, I will present recent advances in variational multiscale (VMS) methods that address various technological and scientific challenges in marine and wind energy applications. These challenges include high-Reynolds number turbulent flows in complex domains, wake-structure interactions, free-surface and cavitation effects, complex topography, stratification, and more. The numerical framework developed by the CFSMgroup at the University of Calgary (<https://www.cfsmgroup.com/>) utilizes the incompressible Navier-Stokes equations, along with a transport equation for vapor/volume fraction (for multiphase flows) or temperature (for stratified flows). The VMS method operates as an LES-like approach, eliminating the need for filters or artificial dissipation. The formulation supports both linear finite elements and quadratic NURBS discretization, with enhanced stability and accuracy near walls achieved through weak imposition of boundary conditions, similar to classical wall modeling approaches. The robustness and accuracy of this framework will be demonstrated through a range of challenging applications, including simulations of vertical-axis hydrokinetic turbines in turbulent flow with free surfaces, full-scale and geometrically complex cavitating flow simulations, wind farm modeling under stable atmospheric boundary layers, flow over complex terrains, and more.



Prof. **Antonia Larese** (Università degli Studi di Padova)

Integrating Multiphysics and Particle-Based Techniques: A New Frontier in Natural Hazard-Structure Interaction Modeling

Climate change has intensified the frequency and severity of natural hazards involving large mass movements such as landslides, debris flows, and mud flows. These phenomena pose significant threats to structures, landscapes, and human life, necessitating urgent scientific attention and effective mitigation strategies.

The numerical simulation of these events presents significant challenges, primarily due to the need to handle large strain regimes and their intrinsic multiphysics nature.

While the Finite Element Method (FEM) is well-established in many engineering fields, it shows limitations when dealing with large deformations and complex material laws. To overcome this crucial drawback, particle-based methods have emerged as groundbreaking solutions. Among these, the Material Point Method (MPM) stands out as a hybrid technique that blends the advantages of both mesh-based and mesh-less methods.

This study presents recent advances in MPM formulations, including irreducible and mixed formulations stabilized using variational multiscale techniques, as well as partitioned strategies to couple MPM with other methods like FEM or DEM, further enhancing its versatility in multiphysics simulations. These novel numerical formulations aim to accurately simulate multiphysics phenomena involving the interaction of water, air, particles, complex boundaries, and soil in mountainous contexts.

The research focuses on high-fidelity modeling of water-related hazards and their interaction with structures or protection systems. Additionally, recent work on acoustic wave emission, potentially crucial for early warning systems, is presented. All algorithms are implemented within the open-source Kratos-Multiphysics framework.



Prof. **Xinzheng Lu** (Tsinghua University)

Generative-AI Design and Intelligent Optimization of Building Structures

Traditional building structure design methods are inefficient and heavily dependent on engineers' expertise. Emerging generative AI technologies, while promising, require enhancements in the safety and cost-effectiveness of their designs. This study introduces an integrated generative AI and intelligent optimization framework for building structure design. Leveraging generative AI, the intelligent generation algorithm generates feasible design schemes by learning from existing drawings and considering constraints of architectural layout, design conditions, mechanical principles, and empirical rules. Accelerated by data-driven and domain knowledge-enhanced computational models and evaluation functions, the intelligent optimization algorithm refines AI-generated designs swiftly. The proposed method, integrating intelligent generation and optimization, ensures design safety and cost-efficiency, and mitigates the challenges of scarce and poor-quality training data faced by AIs. Case studies demonstrate that the structural designs produced by the proposed method are on par with those of human experts, meeting design criteria and enhancing efficiency. The proposed intelligent design platform has been adopted by over a hundred design and research institutes, impacting thousands of engineering projects.



Prof. **Akiko Matsuo** (Keio University)

Combustion Simulations Beyond the Hazard of Explosion and Detonation

The words "Explosion" and "Detonation" are negative in terms of safety. They destroy our property and are so-called "physical hazards". In particular, "detonation" is a dangerous and unpleasant event, and nobody wants to see the results. Scientifically, detonation is one of the premixed combustion phenomena that propagate at hypersonic speed such as Mach number 5. For several decades, detonation has been attractive to the space propulsion research community as a "detonation engine". Research began with the "pulsed detonation engine (PDE)", in which detonations occur intermittently to produce thrust for space propulsion. Following the trend for PDE, a new type of detonation engine appeared: the "rotating detonation engine". Many research institutions succeeded in developing it, and it was eventually launched on a rocket and tested in space. While detonation engines were being developed in many places, CFD with combustion was a powerful tool for elucidating the physics of the newly developed engines. Today, detonation is also an attractive term from an industrial perspective. In the presentation, I would like to introduce the results of a series of simulations of the fundamentals and development research of detonation engines.



Prof. **Satoru Oishi** (Kobe University)

Digital Twins for Smart Disaster Prevention and Automatically Executing Disaster Simulations

To address the increasing frequency and severity of earthquakes and weather-related disasters, it is essential to rapidly and comprehensively predict the damage and impact of natural disasters, utilizing these insights to enhance response efforts. A disaster prevention digital twin provides a powerful solution by integrating cyber and physical spaces, predicting potential damage, and optimizing response strategies based on these predictions. Our team is developing a disaster prevention digital twin that combines social infrastructure data, social dynamics, and real-time sensing data within cyberspace. This digital twin aims to mitigate damage by supporting appropriate evacuation guidance and accelerating early recovery by effectively assessing repair priorities for damaged infrastructure.



Prof. **Hiroshi Okada** (Tokyo University of Science)

Redefined three-dimensional J-integral and J-integral range ΔJ for finite strain elastic-plastic fracture mechanics (considerations on energy release rate and weakly singular terms)

In this presentation, the redefined three-dimensional J-integral and J-integral range ΔJ as finite strain elastic-plastic crack parameter with considerations on energy release rate and weakly singular terms are presented. The redefined three-dimensional J-integral was proposed by the authors with rigorous considerations on the power of external force and deformation energy stored or dissipated in the solid. In the process of deriving the redefined J-integral, weakly singular terms that were related to the deformation energy dissipation in the vicinity of the crack front were found to arise. They played important roles in the characterization of elastic-plastic crack propagation phenomenon. However, the weakly singular terms have not been discussed in previous studies on the three-dimensional J-integral. Then, the redefined J-integral was extended to the J-integral range ΔJ for cyclic load problems.

Crack propagation analyses both under monotonic and cyclic loads are presented. They reveal that the present redefined J-integral and ΔJ characterize the energy release at and the deformation energy dissipation in the vicinity of the crack front.



Prof. **Shabnam J. Semnani** (University of California, San Diego)

Landslide hazard assessment under changing climate conditions

Rainfall-triggered landslides are widespread natural hazards which take a heavy toll on lives, properties, and infrastructure each year. Estimating the regional evolution of landslide hazard in a changing climate is essential for adaptation planning and risk mitigation efforts. Various data-driven and machine learning based algorithms have been applied to assess landslide susceptibility. However, data-driven methods fail to account for the physical mechanisms behind landslides and are affected by issues such as extrapolation. On the other hand, physics-based models are typically only applicable to a limited region. In this talk, we present the recent advances in data-driven and physics-informed landslide susceptibility assessment techniques as promising tools to investigate landslide susceptibility and its evolution at the regional and national scales to inform decision making and risk mitigation efforts.



Prof. **Fei Xu** (Northwestern Polytechnical University)

The improvement of SPH method and its applications in the field of civil aviation

In recent years, the Smoothed Particle Hydrodynamics (SPH) method has advanced in algorithms and applications. To improve the computational accuracy, stability and efficiency, several numerical algorithms are proposed. Based on Finite Particle Method (FPM), a specified FPM is derived by matrix decomposition, which possesses simple calculation with high efficiency. A generalized FPM algorithm is studied, which has no extra limit on the number of particles and may approach high-order accuracy. Secondly, a DSFPM algorithm is presented to obtain high accuracy at interfaces among multi-material problems. Further, the idea of SFPM is introduced into Total Lagrangian SPH to describe large deformation of solid.

The above improved algorithms with recent progress of SPH in fluid, such as δ SPH, GSPH, provide opportunities to solve complex problems in civil aviation. To meet the airworthiness requirements, these improved methods can be used to evaluate crucial and safety problems, such as the water spray of airplane tires running on the contaminated runway, the airworthiness assessments of aircraft ditching, the bird strikes and discrete fragment impact, etc. Furthermore, other Fluid Solid Interaction problems related to the airplane flying, such as oil tank sloshing, oil pump operation can be simulated. As artificial intelligence and machine learning technologies develop, the SPH method will provide an insightful contribution to engineering problems.



Prof. **Jun Yan** (Dalian University of Technology)

Intelligent design of topology optimization considering physics-related information

Structural optimization design is an effective means to achieve innovative structural design configurations, widely applied in structural design fields such as aerospace, automotive, and marine engineering. However, with the increase of the problem complexity, the number of structural design variables has surged, traditional topology optimization methods face the significant computational challenges. Due to the powerful nonlinear learning and computational capabilities of deep learning algorithms, applying deep learning algorithms to topology optimization design to speed up the topology optimization process has emerged as the most promising new discipline in topology optimization. This paper significantly improves the efficiency of topology optimization by combining deep learning models with traditional topology optimization methods such as SIMP (Solid Isotropic Material Penalty) and MMC (Moving Morphable Component). By incorporating physics-related information (such as principal stress matrices and temperature gradient matrices) into model training, a neural network prediction model based on a small sample set is constructed, yielding highly accurate prediction results. A data preprocessing method and a new form of loss function PMSE (Penalty Mean Square Error) that conform to the data characteristics of the optimization algorithm are proposed to improve the model prediction accuracy for structural boundaries. At the same time, the effects of different input modes on the final prediction results are compared. The results show that the introduction of physical information related to the objective function can effectively improve the prediction accuracy of the model, which provides new ideas for topology optimization methods based on deep learning.



Prof. **Zohar Yosibash** (Tel Aviv University)

Autonomous finite element analysis of fracture prediction in human bones applied in clinical practice

The prescription of medications for individuals at risk of osteoporotic hip fractures, or the recommendation of prophylactic surgery for patients with femoral metastases, requires reliable, validated, patient-specific finite element analyses (FEAs). Traditionally, these analyses have been challenging to automate due to their complexity, including geometry generation from CT scans, the application of heterogeneous bone material properties, complex failure laws, and physiological boundary conditions.

Recent advancements such as low-dose CT scanning, machine learning, and high-order FEAs with inherent accuracy verification now enable a fully autonomous approach to evaluating bone strength and fracture risk. This new approach, termed autonomous finite element (AFE) analysis, represents a paradigm shift in FEA application.

This presentation introduces a novel patient-specific AFE process for femurs, designed for clinical practice. It encompasses automatic femur segmentation from CT scans using U-Net, automated mesh generation and boundary condition applications based on anatomical markers, high-order FE analysis with numerical error control, and an automatically generated report that clearly assesses fracture risk.

Two clinical applications of AFE will be demonstrated: (a) Quantifying fracture risk in patients with femoral tumors, along with surgical recommendations, and (b) opportunistically identifying patients at high risk for hip fractures.



COMSAFE 2025 Schedule Overview

Room 301 (360)	Room 401 (124)	Room 402 (102)	Room 403 (104)	Room 404 (52)	Room 405 (52)	Room 406 (52)	Room 407 (34)	Room 501 (212)	Room 502 (212)	Room 503 (84)	Room 504 (84)	Room 505 (100)
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7/1 (Tue)

09:00-16:00	Conference Excursion											
16:00-20:00	Registration@Kobe International Conference Center, 3F											
18:00-20:00	Welcome Reception @ Portopia Hotel, Owada(South Build. 1F)											

7/2(Wed)

72(Wed)

08:15-17:00	Registration@Kobe International Conference Center, 3F												
08:30-09:00	Coffee Break												
09:00-09:15	Opening Ceremony @ Room301												
09:15-10:15	Plenary Lecture-Prof. Michael Kaliske @ Room 301												
10:15-10:40	Coffee Break												
10:40-11:20	Semi-Plenary Lecture-Prof. Leszek Demkowicz @ Room 301				Semi-Plenary Lecture-Prof. Akiko Matsuo @ Room 501				Semi-Plenary Lecture-Prof. Fei Xu @ Room 502				
11:20-12:00	Semi-Plenary Lecture-Prof. Tsuyoshi Ichimura @ Room 501						Semi-Plenary Lecture-Prof. Antonia Larese @ Room 502						
12:00-13:00	Lunch Break @Ariston Hotel/Kobe Sankan												
13:00-15:00	MS16	MS08	MS22	MS06	MS10	MS09	MS11	MS24	MS05	MS07	MS17	MS20	MS01
15:00-15:30	Coffee Break												
15:30-17:30	MS16	MS08	MS22	MS06	MS10	MS09	MS11	MS24	MS05	M07	MS17	MS20	MS01

7/3(Thu)

08:15-17:00	Registration@Kobe International Conference Center, 3F												
08:30-09:00	Coffee Break												
09:00-10:00	Plenary Lecture-Prof. Jung-Wuk Hong @ Room 301												
10:00-10:20	Coffee Break												
10:20-11:00	Semi-Plenary Lecture-Prof. Artem Korbenko @ Room 501						Semi-Plenary Lecture-Prof. Hiroshi Okada @ Room 502						
11:00-11:40	Semi-Plenary Lecture-Prof. Shabnam J. Semnani @ Room 501						Semi-Plenary Lecture-Prof. Satoru Oishi @ Room 502						
11:40-13:00	Lunch Break @Ariston Hotel/Kobe Sankan												
13:00-15:00	MS16	MS08	MS22	MS06	MS10	MS09	MS11	MS25	MS05	MS07	MS17	MS20	MS01
15:00-15:30	Coffee Break												
15:30-17:30	MS16	MS08		MS06	MS13	MS15	MS03	MS25	MS05	MS07	MS14	MS02	
18:30-21:00	Banquet@Portopia Hotel, Owada(South Build. 1F)												

7/4(Fri)

08:15-17:00	Registration@Kobe International Conference Center, 3F												
08:30-09:00	Coffee Break												
09:00-10:00	Plenary Lecture-Prof. Yuan Tong Gu @ Room 301												
10:00-10:20	Coffee Break												
10:20-11:00	Semi-Plenary Lecture-Prof. Kiao Inthavong @ Room 501						Semi-Plenary Lecture-Prof. Xinzheng Lu @ Room 502						
11:00-11:40	Semi-Plenary Lecture-Prof. Zohar Yosibash @ Room 501						Semi-Plenary Lecture-Prof. Jun Yan @ Room 502						
11:40-13:00	Lunch Break @Ariston Hotel/Kobe Sankan												
13:00-15:00	MS16	MS08	MS04	MS12	MS13	MS15	MS03		MS05	MS07	MS14	MS02	MS23
15:00-15:30	Coffee Break												
15:30-17:30			MS04	MS12	MS18	MS21					MS14	MS02	MS23
17:40-17:45	Closing Celemony @ Room301												

MS-01: Combustion Simulations for Safety and Environmental Problems

Akiko Matsuo (Keio University), Yuji Nakamura (Toyohashi University of Technology), Ryoichi Kurose (Kyoto University), Huangwei Zhang (National University of Singapore), Xinyan Huang (Hong Kong Polytechnic University)

MS-02: Computational Methods for Water Environmental Problems and Coastal/Flood Disaster Mitigation

Kazuo Kashiya (Chuo University), Ethan Kubatko (The Ohio State University), Clint Dowson (The University of Texas at Austin), Eirik Valse (The University of Texas at Austin)

MS-03: Advances in Hypercomplex Disaster Simulation and Modeling

Joannes J. Westerink (University of Notre Dame), Seizo Tanaka (Hiroshima Institute of Technology), Takatoshi Kiriya (Shimizu Corporation), Mitsuteru Asai (Kyushu University), Shinsuke Takase (Hachinohe Institute of Technology)

MS-04: Numerical Simulation in Geomechanics and Geodisasters Co-organized by TC103 of International Society for Soil Mechanics and Geotechnical Engineering

Kazunori Fujisawa (Kyoto University), Takayuki Shuku (Tokyo City University), Babloo Chaudhary (National Institute of Technology Karnataka), Vikas Sharma (Kyoto University)

MS-05: Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics

Koji Nishiguchi (Nagoya University), Naoto Mitsume (University of Tsukuba), Shunhua Chen (Sun Yat-sen University), Tetsuya Matsuda (University of Tsukuba), Toshiyuki Imamura (RIKEN), ChungGang Li (National Cheng Kung University), Wei-Hsiang Wang (National Chung Hsing University), Hiroyuki Omura (National Research Institute for Earth Science and Disaster Resilience)

MS-06: Multiscale Modeling for Safety and Environmental Problems

Akiyuki Takahashi (Tokyo University of Science), Yuichi Tadano (Saga University), Tong-Seok Han (Yonsei University)

MS-07: Multiscale Modeling and Multiscale Analysis for Computational Materials and Engineering Applications.

Shu-Wei Chang (National Taiwan University), Seunghwa Ryu (Korea Advanced Institute of Science and Technology)

MS-08: Recent Advances in Impact and Blast Analyses

Masahiro Beppu (National Defense Academy), Piotr Sielicki (Poznan University of Technology), Akemi Nishida (Japan Atomic Energy Agency), Masato Komuro (Muran Institute of Technology), Wensu Chen (Curtin University), Yifei Hao (Hebei University of Technology), Xihong Zhang (Curtin University), Toshiyuki Horiguchi (National Defense Academy), Thong Pham (University of South Australia)

MS-09: Recent Advances in Computational Fracture Mechanics and Failure Analysis

Yoshitaka Wada (Kindai University), Hiroshi Okada (Tokyo University of Science), Toshio Nagashima (Sophia University), Xiaosheng Gao (Acron University), Ayhan Ince (Concordia University), Adrian Loghin (Simmetrix Inc.)

MS-10: Deep and Machine Learning Methodology in the Context of Application to Computational Mechanics

Yoshitaka Wada (Kindai University), Yasushi Nakabayashi (Toyo University), Masao Ogino (Daido University), Akio Miyoshi (Insight Inc.), Shinobu Yoshimura (University of Tokyo)

MS-11: Structural Optimization for Creating a Better Society

Shintaro Yamasaki (Waseda University), Junji Kato (Nagoya University), Akihiko Takezawa (Waseda University), Xiaopeng Zhang (Dalian University of Technology)

MS-12: Simulation of Earthquake Hazards and Disasters with HPC

Kohei Fujita (The University of Tokyo), Takane Hori (Japan Agency for

Marine-Earth Science and Technology), Tsuyoshi Ichimura (The University of Tokyo), Kengo Nakajima (The University of Tokyo/RIKEN)

MS-13: Particle-based Numerical Methods for Simulating Solid-granular Interactions

Yupeng Jiang (Leibniz University Hannover), Clarence Choi (The University of Hong Kong), Kenjiro Terada (Tohoku University), Hashimoto Ryota (Kyoto University), Bodhinanda Chandra (UC Berkeley)

MS-14: Meshless and Particle Method for Safety Problems

Mitsuteru Asai (Kyushu University), Moubin Liu (Peking University), Abbas Khayyer (Kyoto University), Min Luo (Zhejiang University), Seiya Hagihara (Saga University), Seiichi Koshizuka (University of Tokyo)

MS-15: Direct Computation of Safety Margins for Structures and Materials

Konstantinos V. Spiliopoulos (National Technical University of Athens), Geng Chen (Beijing Jiatong University)

MS-16: Advances in Numerical Methods for Enhancing Safety and Resilience of Structures in Civil and Architectural Engineering

Takuzo Yamashita (National Research Institute for Earth Science and Disaster Resilience), Poh Leong Hien (National University of Singapore), Wei-Tze Chang (National Center for Research on Earthquake Engineering)

MS-17: Stochastic Simulation, Uncertainty Quantification, Verification and Validation

Mao Kurumatani (Ibaraki University), Kazumi Matsui (Yokohama National University), Naoki Takano (Keio University)

MS-18: Damage Evaluation and Structural Application of Cementitious Materials

Rena C Yu (University of Castilla-La Mancha), Zhimin Wu & Hui Jin (Zhejiang University of Science and Technology)

MS-20: Simulation-based Disaster Prediction and Mitigation

Ha H. Bui (Monash University), J. S. Chen (University of California San Diego), Jinhyun Choo (Korea Advanced Institute of Science & Technology), Tsung-Hui "Alex" Huang (National Tsing Hua University), Antonia Larese (University of Padova), Kuan-Chung Lin (National Cheng Kung University), Kenjiro Terada (Tohoku University)

MS-21: Mathematical Modelling and Simulation for Social, Environmental, and Disaster Prevention Issues

S. Yoshimura (University of Tokyo), K. Kashiya (Chuo University), H. Fujii (University of Tokyo), T. Ichimura (University of Tokyo), E. Kita (Nagoya University)

MS-22: Innovative CAE for Vehicle Development and Cross-industry Applications toward Safety and Sustainability

Makoto Tsubokura (Kobe University), Chenguang Lai (Chongqing University of Technology), Thomas Indinger (Technical University of Munich)

MS-23: Computational Fluid and Particle Dynamics of the Nose and Airway in Association with SCONA

Kiao Inthavong (RMIT University), Kazuhide Ito (Kyushu University), Narinder Singh (University of Sydney)

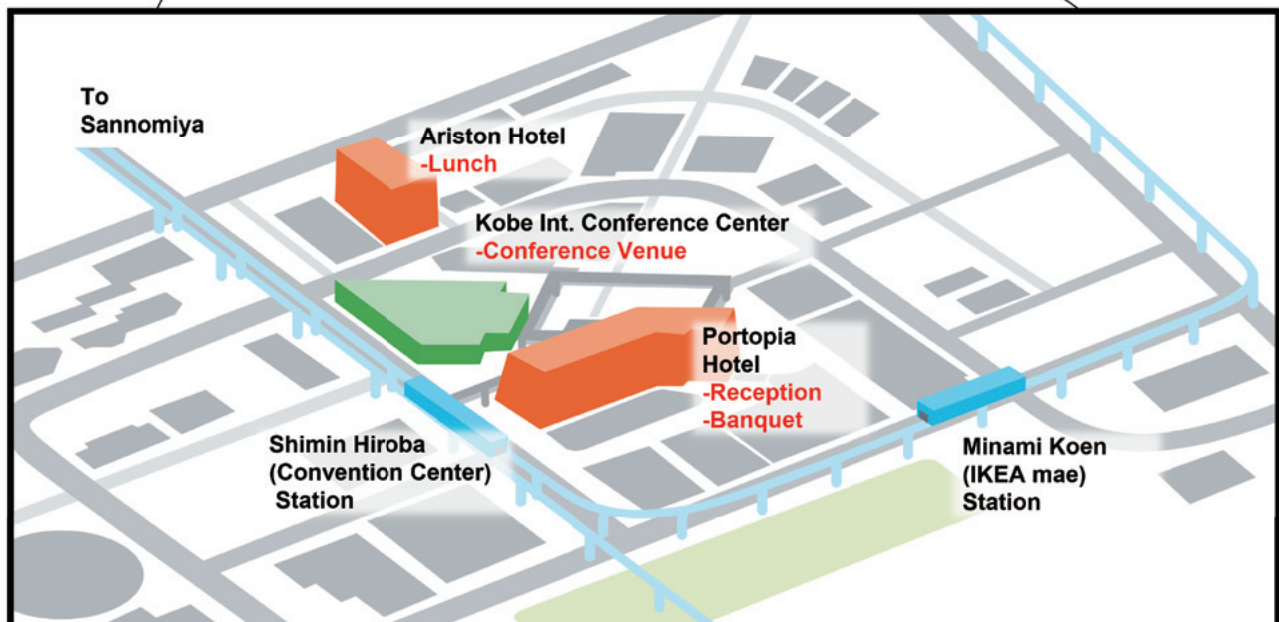
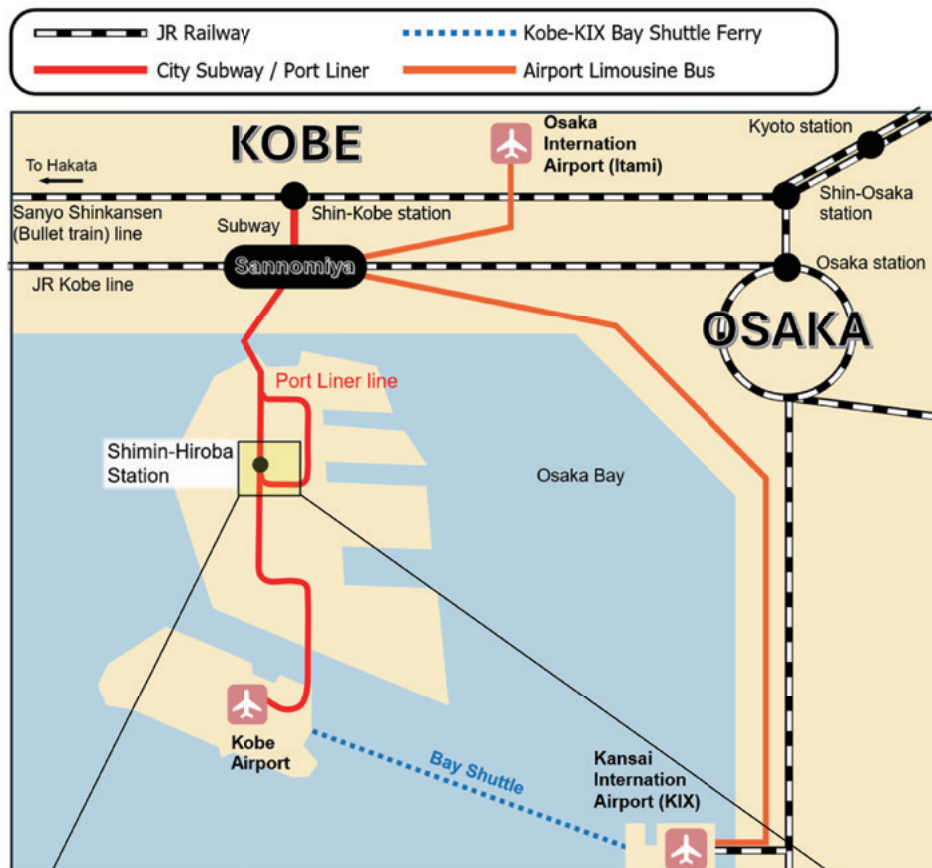
MS-24: High Performance Computing for Environmental Problems

Takashi Shimokawabe (University of Tokyo), Lutz Gross (The University of Queensland), Hiroshi Okuda (University of Tokyo), Gabriel Wittum (Goethe University Frankfurt), Ryuji Shioya (Toyo University)

MS-25: Creating a Rational Disaster Response Society Through an Automatic System for Creating Disaster Prevention Digital Twins and Numerous Hazard Simulations.

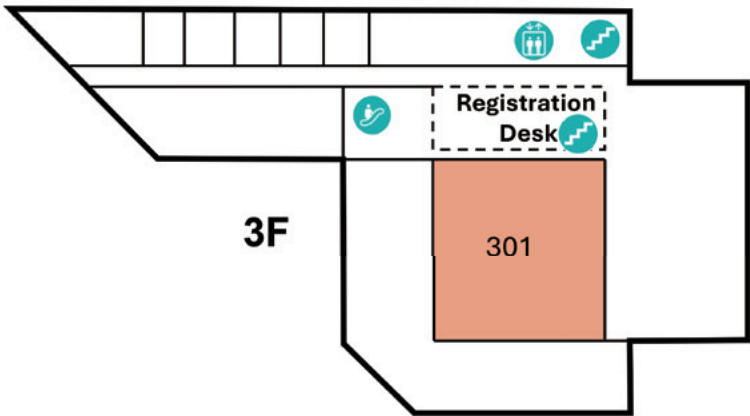
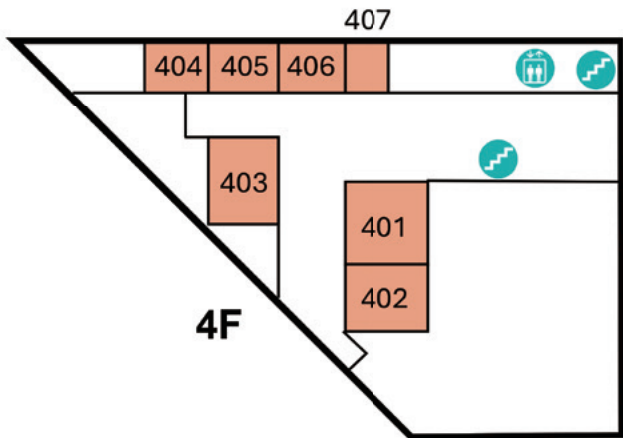
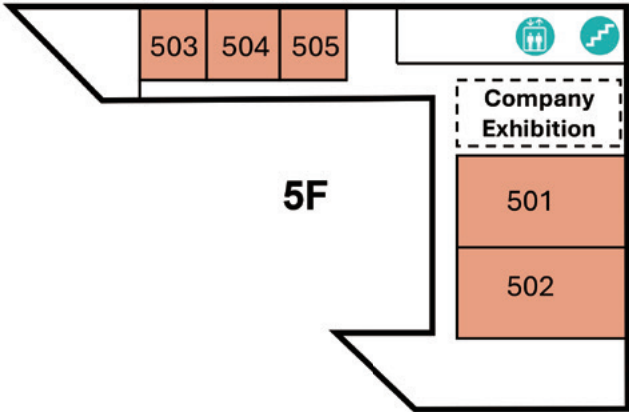
Satoru Oishi (Kobe University), Xinzhen Lu (Tsinghua University), Tomohide Takeyama (Kobe University), Shinya Tachibana (Kobe University), Atsushi Iizuka (Chuo University), Muneo Hori (Japan Agency for Marine-Earth Science and Technology)

COMSAFE 2025 Conference Venue

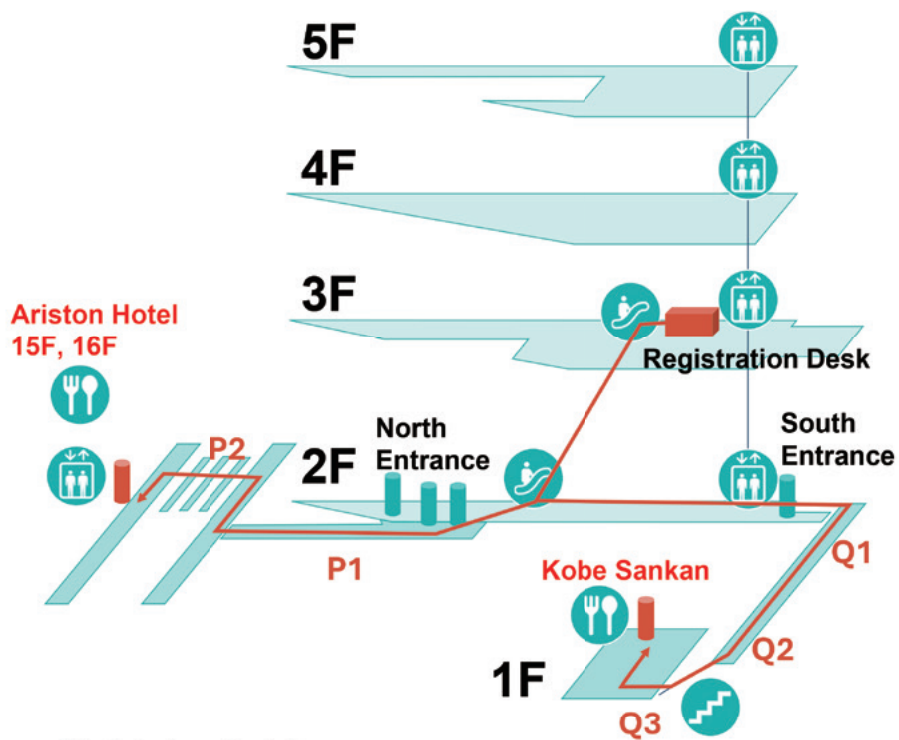


COMSAFE 2025 Conference Venue

Kobe Int. Conference Center



COMSAFE 2025 Access to the Lunch Venues



To Ariston Hotel



To Kobe Sankan



Program

Wed. Jul 2, 2025

Plenary Lecture

9:15 AM - 10:15 AM

Room 301

[230101-01]

Theoretical-numerical Approaches to Damage and Fracture Analysis of Structures

Prof. Michael Kaliske (Technische Universität Dresden)

Chairman:

Kenjiro Terada (Tohoku University)

Semi-Plenary Lecture

10:40 AM - 11:20 AM

Room 301

[230102-02]

DPG Method on a New Road to Nonlinear Problems

Prof. Leszek Demkowicz (The University of Texas at Austin)

Chairman:

Jung-Wuk Hong (Korea Advanced Institute of Science and Technology)

10:40 AM - 11:20 AM

Room 501

[250101-01]

Combustion Simulations Beyond the Hazard of Explosion and Detonation

Prof. Akiko Matsuo (Keio University)

Chairman:

Ryoichi Kurose (Kyoto University)

10:40 AM - 11:20 AM

Room 502

[250201-01]

The improvement of SPH method and its applications in the field of civil aviation Prof. Fei Xu (Northwestern Polytechnical University)

Chairman:

Mitsuteru Asai (Kyushu University)

11:20 AM - 12:00 PM

Room 501

[250102-02]

Redefined three-dimensional J-integral and J-integral range ΔJ for finite strain elastic-plastic fracture mechanics (considerations on energy release rate and weakly singular terms)

Prof. Hiroshi Okada (Tokyo University of Science)

Chairman:

Ryoichi Kurose (Kyoto University)

11:20 AM - 12:00 PM

Room 502

[250202-02]

Integrating Multiphysics and Particle-Based Techniques: A New Frontier in Natural Hazard- Structure Interaction Modeling

Prof. Antonia Larese (Università degli Studi di Padova)

Chairman:

Mitsuteru Asai (Kyushu University)

Oral Presentation

[250501-05] MS-01-1

Combustion Simulations for Safety and Environmental Problems

1:00 PM - 3:00 PM

Room 505

Chairman:

Ryoichi Kurose (Kyoto University)

1:00 PM - 1:40 PM

[250501-05-01]

Fighting fire with data: How can advances in modeling, machine learning, and data analytics address challenges in wildfire mitigation?

*Matthias Ihme¹ (1. Stanford University)

1:40 PM - 2:00 PM

[250501-05-02]

Study on variability in burning characters of pool fires with a controlled gasification methodology

*Daiki Matsugi¹, Yuji Nakamura¹ (1. Toyohashi University of Technology)

2:00 PM - 2:20 PM

[250501-05-03]

Large Eddy Simulation of the inclined surface fire under ambient wind

*Yanli Miao^{1,2}, Peng Xiao¹ (1. State Grid Jiangsu Electric Power Co., Ltd. Research Institute, 2. School of Electronic Science and Engineering, Southeast University)

2:20 PM - 2:40 PM

[250501-05-04]

Assessment of FDS applicability for Modeling Fire Suppression in Car Carrier with Carbon Dioxide Fire Extinguishing System

*Sangwon Kim¹, Ayato Takii², Makoto Tsubokura^{2,1}, Masaki Kubo³, Shigeo Kawamura³, Hirohumi Onishi³, Yusaku Fujii⁴, Yuki Higuchi⁴, Yoichi Otani⁴, Tsumuraya Koji⁵, Masashi Hirano⁵, Nobuyuki Musrasako⁵, Yasuyoshi Tarao⁶ (1. RIKEN Center for Computational Science, 2. Graduate School of System Informatics, Kobe University, 3. Air Water Safety Service Inc., 4. Shin Kurushima Dockyard Co.Ltd., 5. Kawasaki Kisen Co.Ltd., 6. Nippon Kaiji Kyokai)

2:40 PM - 3:00 PM

[250501-05-05]

Validation of diffusion flame CFD modeling for porous-bed gas burner fire applications

*Jakub Bielawski^{1,2}, Dia Luan^{3,2}, Wai Kit Cheung^{2,1}, Xiaoning Zhang², Xinyan Huang², Wojciech W.grzy.ski¹ (1. Building Research Institute, 2. Hong Kong Polytechnic University, 3. Central South University)

[250506-11] MS-01-2**Combustion Simulations for Safety and Environmental Problems****3:30 PM - 5:30 PM****Room 505****Chairman:****Akiko Matsuo (Keio University)**

3:30 PM - 3:50 PM

[250506-11-01]

Fire Heat Release Rate Recognition Based on Multi-Scale Atrous Attention Mechanism and SAM Large Model

*Jinrong Cui¹, Rongxing Li¹, Shiqi Huang¹, Kaihua Zheng¹, Jinhui Xu¹, Yong Xu² (1. College of Mathematics and Informatics, South China Agricultural University, Guangzhou, China, ². Harbin Institute of Technology (Shenzhen), Shenzhen, China)

3:50 PM - 4:10 PM

[250506-11-02]

Statistical analysis of flashback of turbulent lean hydrogen premixed flame in turbulent channel flow

*Reo Kai¹, Kazuhiro Kinuta², Hiroaki Watanabe¹, Ryoichi Kurose² (1. Kyushu University, 2. Kyoto University)

4:10 PM - 4:30 PM

[250506-11-03]

Analysis of displacement speed during flashback of low-swirling hydrogen-air jet flames: An LES study

*Maho Kawai¹, Abhishek Lakshman Pillai¹, Ryoichi Kurose¹ (1. Kyoto University)

4:30 PM - 4:50 PM

[250506-11-04]

Numerical Simulation of Coherent Structures in Boundary Layer Flame

*Yue ZHANG¹, Yuji NAKAMURA¹ (1. Toyohashi University of Technology)

4:50 PM - 5:10 PM

[250506-11-05]

Prediction of Premixed Hydrocarbon Flames under Stretched Condition Using the LTF-S Model

*Tongtong Cui¹, Hiroshi Terashima¹, Soshi Kawai² (1. Division of Mechanical and Aerospace Engineering, Hokkaido University, 2. Department of Aerospace Engineering, Tohoku University)

5:10 PM - 5:30 PM

[250506-11-06]

Transient Behaviors of the Smoldering and Flaming Combustion of Charring Materials

*Pichayaporn Viriya-amornkij¹, Kazunori Kuwana¹, Yasuhisa Saito², Xinyan Huang³ (1. Tokyo University of Science, 2. Shimane University, 3. The Hong Kong Polytechnic University)**[250103-07-01] MS-05-1****Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics****1:00 PM - 3:00 PM****Room 501****Chairman:****Naoto Mitsume (University of Tsukuba)**

1:00 PM - 1:20 PM

[250103-07-01]

Physics-Informed Neural Networks (PINNs) for heat transfer and flow interaction

*Edward Oliver Teng¹, Chung Gang Lee¹, Heng Chuan Kan² (1. National Cheng Kung University Department of Mechanical Engineering, 2. National Center for High-performance Computing, National Applied Research Laboratories)

1:20 PM - 1:40 PM

[250103-07-02]

Development of a Lagrange multiplier/cohesive zone approach for dynamic internal interfacial crack interactions

*YIFANG QIN¹ (1. Sun Yat-sen University)

1:40 PM - 2:00 PM

[250103-07-03]

Evaluation of mechanical metamaterials for high-performance shock absorption and stability in fall prevention

*Taiga Matsumoto¹, Koji Nishiguchi^{1,2}, Hiroshi Shimomura³, Akihiro Ikki³, Masato Yokoi³, Mayumi Ito³, Hiroya Hoshiba¹, Junji Kato¹ (1. Nagoya university, 2. RIKEN, 3. Magic Shields, Inc.)

2:00 PM - 2:20 PM

[250103-07-04]

A Novel Numerical Method with full Eulerian approach for Coupled Fluid-Structure Topology Optimization

*Ryohei Katsumata¹, Koji Nishiguchi^{1,2}, Hiroya Hoshiba¹, Junji Kato¹ (1. Nagoya University, 2. RIKEN)

2:20 PM - 2:40 PM

[250103-07-05]

Impact of Amplitude Variation Trends on Natural Convection over Vertical Wavy Surfaces

*Tse-Yu Chen¹, Chung-Gung Li¹, Wu-Shung Fu² (1. National Cheng Kung University, 2. National Yang Ming Chiao Tung University)**[250108-12] MS-05-2****Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics****3:30 PM - 5:30 PM****Room 501****Chairman:****Chung-Gung Li (National Cheng Kung University)**

3:30 PM - 4:10 PM

[250108-12-01]

A multi-GPU computational framework for large-scale phase field crack simulations

Hanming Yang¹, Daniel Shigueo Morikawa², Yiyu Tan³, Toshiyuki Imamura⁴, *Shunhua Chen⁵ (1. South China University of Technology, 2. Japan Agency for Marine-Earth Science and Technology, 3. Iwate University, 4. RIKEN Center for Computational Science, 5. Sun Yat-sen University)

4:10 PM - 4:30 PM

[250108-12-02]

Eulerian Elastoplastic Simulation Considering Internal Voids in Structures

*Yuuri Ozaki¹, Koji Nishiguchi^{1,2}, Junji Kato¹ (1. Nagoya University, 2. RIKEN Center for Computational Science)

4:30 PM - 4:50 PM

[250108-12-03]

A 3D Generative Model Based on Time-Series Data from Eulerian Structural Analysis

*Koichiro Nakaya¹, Koji Nishiguchi^{1,2}, Issei Toida¹, Naoya Chiba³, Junji Kato¹ (1. Nagoya University, 2. RIKEN Center for Computational Science, 3. D3 Center, Osaka University)

4:50 PM - 5:10 PM

[250108-12-04]

Vibration-reducing bushings design with topology optimization

*Tojo Soma¹, Hiroya Hoshiba¹, Toshitaka Sugimoto², Shinji Azetsu², Koji Nishiguchi¹, Junji Kato¹ (1. Department of Civil and Environmental Engineering, Nagoya University, 2. Honda R & D Co., Ltd.)

5:10 PM - 5:30 PM

[250108-12-05]

Hierarchical Reduced-Order Modeling with Adaptive Basis Selection and Load Balancing

*Kyohei Shintate¹, Naoki Morita¹, Shigeki Kaneko², Naoto Mitsume¹ (1. University of Tsukuba, 2. Nagoya Institute of Technology)

[240301-04] MS-06-1

Multiscaling for Safety and Environmental Problems

1:00 PM - 3:00 PM

Room 403

Chairman:

Yuichi Tadano (Saga University)

1:00 PM - 1:40 PM

[240301-04-01]

Analysis of gradient characteristics in cement mortar interfacial transition zones (ITZs) and their impact on mechanical behavior using micro-CT

*Sang-Yeop Chung¹, Ji-Su Kim² (1. Yonsei University, 2. University of Seoul)

1:40 PM - 2:00 PM

[240301-04-02]

Multiscale Modeling and Simulation for Predicting Tensile Strength of Cement Paste Incorporating Calcined Clay

*Donghwi Eum¹, Ju-Hyeon Park¹, Tong-Seok Han¹ (1. Yonsei University)

2:00 PM - 2:20 PM

[240301-04-03]

Multiscale analysis framework to identify correlation between microstructure and strength of cement paste

*Yong-Woo Kim¹, Se-Yun Kim¹, Donghwi Eum¹, Tong-Seok Han¹ (1. Yonsei University)

2:20 PM - 2:40 PM

[240301-04-04]

Influence of sand mixture ratio on cyclic deformation property for compacted bentonite

*Tomoyoshi Nishimura¹ (1. Ashikaga University)

[240305-10] MS-06-2

Multiscaling for Safety and Environmental Problems

3:30 PM - 5:30 PM

Room 403

Chairman:

Sang-Yeop Chung (Yonsei University)

3:30 PM - 3:50 PM

[240305-10-01]

Strain localization analysis using higher-order gradient crystal plasticity model

*Yuichi Tadano¹, Yuki Okawa¹ (1. Saga University)

3:50 PM - 4:10 PM

[240305-10-02]

Refinement by a negative exponent on I_4 to avoid the instability of fiber-reinforced hyperelastic materials

*Hio Konishi¹, Seishiro Matsubara¹, So Nagashima¹, Dai Okumura¹ (1. Nagoya University)

4:10 PM - 4:30 PM

[240305-10-03]

Surrogate macroscopic constitutive model of a nonreciprocal gel

*Yuto Inamae¹, Seishiro Matsubara¹, So Nagashima¹, Dai Okumura¹ (1. Nagoya University)

4:30 PM - 4:50 PM

[240305-10-04]

Evaluation and modeling of effect of thermal history on the mechanical behavior of polyamides

*Makoto Uchida¹, Mei Toji¹, Keito Ohya¹, Yoshihisa Kaneko¹ (1. Osaka Metropolitan University)

4:50 PM - 5:10 PM

[240305-10-05]

Direct data-driven approach for sequential boundary value problems in two-phase materials

*Misato Suzuki¹, Erik Prume², Stefanie Reese^{2,3}, Mayu Muramatsu¹ (1. Keio University, 2. RWTH Aachen University, 3. University of Siegen)

5:10 PM - 5:30 PM

[240305-10-06]

Numerical Analysis of Respiratory Protective Gear Performance in Toxic Gas Leak Scenarios

*Feifan He^{1,2}, Sheng He^{1,2}, Jialin Wu³, Wenguo Weng^{1,2} (1. School of Safety Science, Tsinghua University, 2. Beijing Key Laboratory of City Integrated Emergency Response Science, Tsinghua University, 3. College of Safety Science and Engineering, Nanjing Tech University)

[250203-08] MS-07-1

Multiscale modeling and multiscale analysis for computational materials and engineering applications

1:00 PM - 3:00 PM

Room 502

Chairman:

Shu-Wei Chang (National Taiwan University)

1:00 PM - 1:20 PM

[250203-08-01]

Mycelium-Based Multifunctional Surface Coating for Sustainable Composites

*Zhao Qin Qin¹, Ludovica Clementini², Gargi De¹, Federica Buccino², Laura Vergani² (1. Syracuse University, 2. Politecnico di Milano)

1:20 PM - 1:40 PM

[250203-08-02]

Establishment of a fatigue life prediction framework for steels based on a multiscale modeling for simulating crack growth

*Kazuki Shibanuma¹ (1. The University of Tokyo)

1:40 PM - 2:00 PM

[250203-08-03]

Design of metallic glass and nanoglass composites using a mesoscale kinetic Monte Carlo model

*Chang-Wei Huang¹, Chih-Jen Yeh², Yu-Chieh Lo² (1. Department of Civil Engineering, Chung Yuan Christian University, Taiwan, 2. Department of Materials Science and Engineering, National Yang Ming Chiao Tung University, Taiwan)

2:00 PM - 2:20 PM

[250203-08-04]

Tailored-mechanical-properties structures inspired by bone microstructures using deep learning-based methods

*Zheng-Shun Su¹, Bo-Xue Chen¹, Kuan-Lun Huang¹, Shu-Wei Chang¹ (1. National Taiwan University)

2:20 PM - 2:40 PM

[250203-08-05]

Imaging and modeling analysis of mitochondrial morphology and dynamics

Jirapong Saelor¹, Tzu-Yen Liao², Yu-Te Lin², Wen-Wei Tseng², *An-Chi Wei² (1. The Chinese University of Hong Kong, 2. National Taiwan University)

2:40 PM - 3:00 PM

[250203-08-06]

Molecular Dynamics Study of the Gating Mechanism in the KtrAB Potassium Transport System

*Pei-Cheng Li¹, Wei-Han Hui¹, Shu-Wei Chang^{1,2} (1. Dept. of Civil Engineering, National Taiwan University, Taipei 10663, Taiwan, R.O.C, 2. Dept. of Biomedical Engineering, National Taiwan University, Taipei 10663, Taiwan, R.O.C)

[250209-12] MS-07-2

Multiscale modeling and multiscale analysis for computational materials and engineering applications

3:30 PM - 5:30 PM

Room 502

Chairman:

Chang-Wei Huang (Chung Yuan Christian University)

3:30 PM - 3:50 PM

[250209-12-01]

Enhanced Energy Harvesting in Rotary Triboelectric Nanogenerators via Gaussian Process Regression-Based Bayesian Optimization

*Seunghwa Ryu¹ (1. KAIST)

3:50 PM - 4:10 PM

[250209-12-02]

Design of Tunable Acoustic Metasurfaces

*I-Ling Chang¹ (1. National Cheng Kung University)

4:10 PM - 4:30 PM

[250209-12-03]

Irradiation effects on ultimate pressure capacity of a steel containment vessel

*Min Jeong Park¹, Yoon-Suk Chang¹ (1. Kyung Hee University)

4:30 PM - 4:50 PM

[250209-12-04]

Multiphysics Phase Field Modeling for Accelerating Materials Design and Realization

*Yanming Wang¹ (1. Shanghai Jiao Tong University)

[240101-04] MS-08-1

Recent advances in impact and blast analyses

1:00 PM - 3:00 PM

Room 401

Chairman:

Masuhiko Beppu (National Defense Academy)

Akemi Nishida (Japan Atomic Energy Agency)

1:00 PM - 1:40 PM

[240101-04-01]

Design of protective structures: debris loading on the buried construction - numerical approach

*Piotr W. Sielicki¹ (1. Poznan University of Technology)

1:40 PM - 2:00 PM

[240101-04-02]

Annual occurrence probabilities of design blast loads acting on building structures

*Akemi Nishida¹, Toshiya Kano², Toshiyuki Horiguchi³, Takuya Hamamoto⁴ (1. Japan Atomic Energy Agency, 2. JSOL CORPORATION, 3. National Defense Academy, 4. Tokyo City University)

2:00 PM - 2:20 PM

[240101-04-03]

Predicting the response of reinforced concrete components subjected to low-speed planar impact due to frame collapse in fire

*Shuhei Fukumura¹, Yasunori Mizushima¹, Junichi Suzuki², Tomohiro Naruse², Michikazu Kobayashi³, Yoko Hirano⁴ (1. Kobe University, 2. Building Research Institute, 3. Takenaka Corporation, 4. Dot Corporation)

2:20 PM - 2:40 PM

[240101-04-04]

Dynamic increase factor of concrete compressive strength under uniaxial strain state

*Sangho Lee¹ (1. Korea Institute of Civil Engineering and Building Technology)

[240105-10] MS-08-2

Recent advances in impact and blast analyses

3:30 PM - 5:30 PM

Room 401

Chairman:

Xihong Zhang (Curtin University)

Hiroki Tamai (Kyushu University)

3:30 PM - 3:50 PM

[240105-10-01]

Investigations of autoclaved aerated concrete walls subjected to blast loadings

*Chunyuan Liu¹, Yifei Hao¹, Shan Liu² (1. Hebei University of Technology, 2. Tianjin University)

3:50 PM - 4:10 PM

[240105-10-02]

Blast resilience of RC slab using sprayed engineered geopolymer composite

Shan Liu^{1,2}, *Yifei Hao³ (1. Tianjin University, 2. Nanyang Technological University, 3. Hebei University of Technology)

4:10 PM - 4:30 PM

[240105-10-03]

Impact response analysis of diamond-shaped wire mesh under drop-weight impact loading

*Masato Komuro¹, Tomoki Kawai¹, Norimitsu Kishi¹ (1. Muroran Institute of Technology)

4:30 PM - 4:50 PM

[240105-10-04]

Study on estimation method of debris flow load using a channel flume with a movable bed and Distinct Element Method

*Kazuki Saito¹, Toshiyuki Horiguchi² (1. Graduate School of Science and Engineering Doctoral Course, National Defence Academy, 2. Civil Engineering, National Defence Academy)

4:50 PM - 5:10 PM

[240105-10-05]

Experimental Investigation of the Fragmentation of SON68 Glass under Normal Impact

Pascal Forquin¹, Charles Francart¹, *Joffrey Lhonneur², Christophe Mano² (1. Soils, Solids, Structures and Risks (3SR) Lab., University Grenoble Alpes, CNRS, Grenoble INP, 38000 Grenoble, FRANCE, 2. Institute for Radiation Protection and Nuclear Safety (IRSN), BP 17-31, avenue de la Division Leclerc, 92262 Fontenay-aux-Roses Cedex, FRANCE)

5:10 PM - 5:30 PM

[240105-10-06]

Numerical simulation on reinforcing and mitigating methods for scabbing of RC slabs subjected to projectile impact

*MASUHIRO BEPPU¹, Koki Mori¹, Ryo Matsuzawa², Hiroyoshi Ichino¹ (1. National Defense Academy, 2. ITOCHU Techno-Solutions Corporation)

[240501-05] MS-09-1**Recent Advances in Computational Fracture Mechanics and Failure Analysis****1:00 PM - 3:00 PM****Room 405****Chairman:****Masaki Shibamura (University of Tokyo)**

1:00 PM - 1:20 PM

[240501-05-01]

Damage Propagation Analyses of CFRP and CFRTP laminates by XFEM using continuumbased shell elements

*Toshio Nagashima¹ (1. Sophia University)

1:20 PM - 1:40 PM

[240501-05-02]

Failure simulation of reactor pressure vessels under In-Vessel Retention through External Reactor Vessel Cooling (IVR-ERVC) condition

*Jun-Won Park¹, Eui-Kyun Park¹, Yun-Jae Kim¹, Kukhee Lim², Eung-Soo Kim³ (1. Korea University, 2. Korea Institute of Nuclear Safety, 3. Seoul National University)

1:40 PM - 2:00 PM

[240501-05-03]

Three-dimensional ductile crack growth analysis of C(T) specimen using stress triaxialitydependent cohesive zone model

*Yanlong Li¹, Toshio Nagashima² (1. Graduate School of Sophia University, 2. Sophia University)

2:00 PM - 2:20 PM

[240501-05-04]

Numerical prediction of combined ductile-brittle fracture in drop weight tear test

*Seo Ki-Wan¹, Jae-Yoon Kim¹, Yun-Jae Kim¹, Ki-Seok Kim² (1. Korea University, 2. POSCO)

2:20 PM - 2:40 PM

[240501-05-05]

Crack propagation analysis in composite material considering adhesion region

*Hirofumi Sugiyama¹, Tomoki Nomura¹, Shigenobu Okazawa¹ (1. University of Yamanashi)

[240506-10] MS-09-2**Recent Advances in Computational Fracture Mechanics and Failure Analysis****3:30 PM - 5:30 PM****Room 405****Chairman:****Toshio Nagashima (Sophia University)**

3:30 PM - 3:50 PM

[240506-10-01]

Ductile Fracture in Welded Thin Plate for Stainless Steel with Multiple Flaws

*Beom-Jin Kim¹, Chang-Young Oh², Jin-Ha Hwang¹ (1. Pukyong National University, 2. Korea Institute of Materials Science (KIMS))

3:50 PM - 4:10 PM

[240506-10-02]

S-version FEM-based strategy for predicting high-speed crack propagation/arrest behaviour in 3D structures

*Tianyu He¹, Naoki Morita², Naoto Mitsume², Kazuki Shibamura¹ (1. The University of Tokyo, 2. University of Tsukuba)

4:10 PM - 4:30 PM

[240506-10-03]

Theoretical and experimental study of crack modes of flow elastoplasticity

*Hong-Ki Hong¹ (1. Department of Civil Engineering, National Taiwan University)

4:30 PM - 4:50 PM

[240506-10-04]

S-IGA with blending functions for finite strain elastoplastic analyses

*Yuhi Tsuchiyama¹, Hiroshi Okada¹ (1. Tokyo University of Science)

4:50 PM - 5:10 PM

[240506-10-05]

Gradient-enhanced ductile fracture modeling on robust algorithm and scale transition

*TIANWEN TAN^{1,2}, Ikumu WATANABE^{1,2} (1. Graduate School of Pure and Applied Sciences, University of TSUKUBA, 2. Center for Basic Research on Materials, National Institute for Materials Science)

[240401-05] MS-10-1**Deep and Machine Learning Methodology in the Context of Application to Computational Mechanics****1:00 PM - 3:00 PM****Room 404****Chairman:****Yasushi Nakabayashi (Toyo University)**

1:00 PM - 1:20 PM

[240401-05-01]

DDM-PINN method for considering boundary conditions inside the analysis domain

*Masao Ogino¹, Shin-ichiro Sugimoto² (1. Daido University, 2. Hachinohe Institute of Technology)

1:20 PM - 1:40 PM

[240401-05-02]

Neural network-based eddy-viscosity prediction for wake flow field of Ahmed model

*Songyuan Hu¹, Yiping Wang¹, Shiqiang Wen¹, Jian Zhao¹ (1.

Wuhan University of Technology)

1:40 PM - 2:00 PM

[240401-05-03]

Accurate inverse analysis of incompressible fluid flow using physics-informed neural networks with implicit distance functions and an adaptive weight tuning method

*Shota Deguchi¹, Mitsuteru Asai¹ (1. Kyushu University)

2:00 PM - 2:20 PM

[240401-05-04]

Analysis of partial differential equations using novel physics-informed neural network techniques

*Der Liang Young¹ (1. National Taiwan University)

2:20 PM - 2:40 PM

[240401-05-05]

A machine learning technique for predicting fluid flow at different conditions based on physics-informed deep operator networks

*Junya Onishi¹, Harutaka Kitagawa², Makoto Tsubokura^{1,2} (1. RIKEN Center for Computational Science, 2. Kobe University)

[240406-09] MS-10-2

Deep and Machine Learning Methodology in the Context of Application to Computational Mechanics

3:30 PM - 5:30 PM

Room 404

Chairman:

Masao Ogino (Daido University)

3:30 PM - 3:50 PM

[240406-09-01]

Deep Learning for High-Resolution Modeling of Accidental Hazardous Releases through Multisource Data Integration

*Yudie Jianyao^{1,2}, Yuheng Cheng^{1,2}, Shuai Liu^{1,2}, Xiaole Zhang^{1,2} (1. School of Safety Science, Tsinghua University, 2. Institute of Public Safety Research, Tsinghua University)

3:50 PM - 4:10 PM

[240406-09-02]

Hybrid strategy of neural network and numerical simulation to accelerate the computation time of SPH method

*Gen Matono¹, Mayuko Nishio¹ (1. University of Tsukuba)

4:10 PM - 4:30 PM

[240406-09-03]

Multi-Scale Learning and Classification Ensemble for Vehicle Point Cloud Regression: A Study on Drag Coefficient Prediction

*Mengdi Li^{1,2,3}, Yiping Wang^{1,2,3}, Chuqi Su^{1,2,3}, Xiaohong Yuan^{1,2,3}, Xun Liu^{1,2,3} (1. Hubei Key Laboratory of Advanced Technology for Automotive Components, Wuhan University of Technology, Wuhan 430070, China, 2. Hubei Collaborative Innovation Centre for Automotive Components Technology, Wuhan University of Technology, Wuhan 430070, China, 3. Hubei Research Center for New Energy and Intelligent Connected Vehicle, Wuhan University of Technology, Wuhan 430070, China)

4:30 PM - 4:50 PM

[240406-09-04]

Predicting the outcome of sports competitions using text mining

*Shuntaro Kanke¹ (1. Toyo University)

[240601-05] MS-11-1

Structural Optimization for Creating a Better Society

1:00 PM - 3:00 PM

Room 406

Chairman:

Shintaro Yamasaki (Waseda University)

Xiaopeng Zhang (Dalian University of Technology)

1:00 PM - 1:20 PM

[240601-05-01]

Data-driven topology design methodology considering additive manufacturing constraints

*Jun Yang¹, Shintaro Yamasaki¹ (1. Waseda University)

1:20 PM - 1:40 PM

[240601-05-02]

Topology optimization for a distribution of two types of miniaturized dynamic vibration absorbers for damping of two vibration modes

*Jun Iwasaki¹, Riku Yoneoka¹, Akihiro Takezawa¹, Yuya Saito², Takeshi Matsuoka², Takahiro Komamura², Naoyuki Uchida², Masanari Nakayama² (1. Waseda University, 2. Mitsubishi Chemical Corporation)

1:40 PM - 2:00 PM

[240601-05-03]

Improved Bi-directional Evolutionary Structural Optimization Method of Stiffness Design with Stress Constraint

*Pei Chen Ko^{1,2}, Liang Jenq Leu¹, Mitsuteru Asai² (1. National Taiwan University, 2. Kyushu University)

2:00 PM - 2:20 PM

[240601-05-04]

Computational design of periodic microstructure with misalignment for mechanical metamaterials

Jiaxin Zhou^{1,2}, *Ikumu Watanabe^{1,2}, Keita Kambayashi³ (1. National Institute for Materials Science, 2. University of Tsukuba, 3. Nagaoka University of Technology)

2:20 PM - 2:40 PM

[240601-05-05]

Design of meta-structures with specific ultra-low bandgaps via topology optimization

*Xinlin Xu¹, Hiroya Hoshiba¹, Koji Nishiguchi¹, Junji Kato¹ (1. Nagoya University)

[240606-10] MS-11-2

Structural Optimization for Creating a Better Society

3:30 PM - 5:30 PM

Room 406

Chairman:

Akihiro Takezawa (Waseda University)

Shintaro Yamasaki (Waseda University)

3:30 PM - 3:50 PM

[240606-10-01]

Distributed-Element Filter Design Considering Manufacturing Errors Based on Data-driven Topology Design

*YUYANG CHEN¹, Shintaro Yamasaki¹ (1. Waseda University)

3:50 PM - 4:10 PM

[240606-10-02]

Design of Mechanical Metamaterials with Precise Performance Customization Using Topology Optimization Methods

*Xiaopeng Zhang¹ (1. Dalian University of Technology)

4:10 PM - 4:30 PM

[240606-10-03]

Topology optimization for maximizing ductility using RBSM

*Ryoko Ishiwata¹, Yoshihito Yamamoto¹, Junji Kato² (1. HOSEI University, 2. Nagoya University)

4:30 PM - 4:50 PM

[240606-10-04]

Numerical investigation of two-body contact system: two-body-based topology optimization for strain energy minimization problem

*Siyue Chang¹, Hiroya Hoshiba¹, Koji Nishiguchi^{1,2}, Junji Kato¹ (1. Nagoya University, 2. RIKEN)

4:50 PM - 5:10 PM

[240606-10-05]

Reconstruction of Kelvin-Voigt viscoelastic parameters using a full-waveform inversion

*Sihyeong Lee¹, Jun Won Kang¹ (1. Hongik University)

[230103-07] MS-16-1

Advances in Numerical Methods for Enhancing Safety and Resilience of Structures in Civil and Architectural Engineering

1:00 PM - 3:00 PM

Room 301

Chairman:

Hiroyuki Tagawa (Mukogawa Women's University)

1:00 PM - 1:20 PM

[230103-07-01]

Detailed FE simulation of RC structures using damage plasticity model with consideration of tensile cracking in concrete material

*Takuzo Yamashita¹, Tomoshi Miyamura², Jun Fujiwara¹ (1. National Research Institute for Earth Science and Disaster Resilience, 2. Nihon University)

1:20 PM - 1:40 PM

[230103-07-02]

Assessment of the Structural Performance of Bumper Walls in Mitigating Seismic Pounding Effects

*Konstantinos Vassilios Spiliopoulos¹, Vasiliki N. Tsotoulidi¹ (1. National Technical University of Athens)

1:40 PM - 2:00 PM

[230103-07-03]

Seismic Damage Evaluation of Reinforced Concrete Tall Piers with Circular Cross Section Using 3D Lattice Model

*Elber de Araujo Silva¹, Tomohiro Miki¹ (1. Kobe University)

2:00 PM - 2:20 PM

[230103-07-04]

Development of a collapse analysis method for timber houses based on the finite element method considering the expansion of plastic regions

*Tomoaki Ohba¹, Shinya Ito¹, Hiroyuki Omura², Daigoro Isobe³ (1. Graduate School of Science and Technology, University of Tsukuba, 2. National Research Institute for Earth Science and Disaster Resilience, 3. Division of Engineering Mechanics and Energy, University of Tsukuba)

2:20 PM - 2:40 PM

[230103-07-05]

Reproducibility of numerical simulations for shaking table test using full-scale specimen of traditional wooden folk house

conducted at E-Defense

*Kiichi Kuboki¹, Misaki Yamashita¹, Yoichi Mukai¹, Kunihiro Nabeshima¹ (1. Kobe University)

2:40 PM - 3:00 PM

[230103-07-06]

Damage identification of braces in steel-framed school gymnasiums using echo state networks

*Jingyao Zhang¹, Taisei Toyama², Jun Fujiwara³ (1. Kyoto University, 2. West Japan Railway Company, 3. National Research Institute for Earth Science and Disaster Resilience)

[230108-12] MS-16-2

Advances in Numerical Methods for Enhancing Safety and Resilience of Structures in Civil and Architectural Engineering

3:30 PM - 5:30 PM

Room 301

Chairman:

Takuzo Yamashita (National Research Institute for Earth Science and Disaster Resilience)

3:30 PM - 4:10 PM

[230108-12-01]

High-Performance In-house Finite Element Framework for Advanced Engineering Applications

*Jeong-Rae CHO¹ (1. Korea Institute of Civil Engineering and Building Technology)

4:10 PM - 4:30 PM

[230108-12-02]

Folding Simulation of Origami Deployable Structure with Uniaxial Rotation of Fold-lines modeled by Solid Elements

*Hiroyuki Tagawa¹, Takuzo Yamashita² (1. Mukogawa Women's University, 2. National Research Institute for Earth Science and Disaster Resilience)

4:30 PM - 4:50 PM

[230108-12-03]

Development of an unresolved fluid-beam coupling scheme based on Darcy-Brinkman equation

*Satoshi Ohinata¹, Hiroyuki Omura², Daigoro Isobe¹ (1. University of Tsukuba, 2. National Research Institute for Earth Science and Disaster Resilience)

4:50 PM - 5:10 PM

[230108-12-04]

An Automated Design System for Beams and Lateral Restraints with Three-side Protection Utilizing Non-Uniform Temperature Beam Elements

*Yang Li¹ (1. The University of Manchester)

5:10 PM - 5:30 PM

[230108-12-05]

Performance simulator based on real-time hybrid simulations of semi-active response control for seismic isolation system

*Misaki Kotani¹, Shito Kageyama¹, Hayato Naka¹, Yoichi Mukai¹, Hideo Fujitani² (1. Kobe University, 2. Fukuyama University)

[250301-05] MS-17-1**Stochastic simulation, uncertainty quantification, verification and validation****1:00 PM - 3:00 PM****Room 503****Chairman:****Mao Kurumatani (Ibaraki University)**

1:00 PM - 1:20 PM

[250301-05-01]

Prediction of post-processing cost in additive manufacturing to recover geometrical imperfection considering its variability

*Tung Thanh Pham¹, Takumi Oshima¹, Naoki Takano² (1. Graduate School of Science and Technology, Keio University, 2. Department of Mechanical Engineering, Keio University)

1:20 PM - 1:40 PM

[250301-05-02]

Uncertainty modeling of contact boundary condition with gum in mechanical simulation of additively manufactured removable partial denture

*Rintaro Morita¹, Naoki Takano² (1. Graduate School of Science and Technology, Keio University, 2. Department of Mechanical Engineering, Keio University)

1:40 PM - 2:00 PM

[250301-05-03]

AI-aided geometrical defect detection for additive manufactured complex architected materials

*pin wen¹, Chenxi Lu¹, Fei Chen¹ (1. Wuhan university of technology)

2:00 PM - 2:20 PM

[250301-05-04]

Effect of Thermal Aging on the Mechanical Properties of 3D Printed Biodegradable Filaments

Md Ashequl Islam¹, *Khairul Salleh Basaruddin^{1,2}, Nor Amalina Muhayuddin^{1,2}, Tien -Dat Hoang³ (1. Faculty of Mechanical Engineering & Technology, Universiti Malaysia Perlis, 2. Centre of Excellence Automotive & Motorsports (MoTECH), Universiti Malaysia Perlis, 3. School of Mechanical and Automotive Engineering (SMAE), Ha Noi University of Industry, VIETNAM)

2:20 PM - 2:40 PM

[250301-05-05]

Triply Periodic Minimal Surfaces in 3D-Printed Bone Scaffolds: A Path to Enhanced Stochastic Mechanical Performance

Dat Tien Hoang¹, *Thuan Ba Nguyen², Khairul Salleh Basaruddin³ (1. School of Mechanical and Automotive Engineering (SMAE), Ha Noi University of Industry, Vietnam., 2. Faculty of Mechanical Engineering, Vinh University of Technology Education, Vietnam, 3. Faculty of Mechanical Engineering and Technology, Universiti Malaysia Perlis, Arau, Malaysia)**[250306-11] MS-17-2****Stochastic simulation, uncertainty quantification, verification and validation****3:30 PM - 5:30 PM****Room 503****Chairman:****Kazumi Matsui (Yokohama National University)**

3:30 PM - 3:50 PM

[250306-11-01]

Random microstructure modeling and stochastic multiscale

simulation of textile and short fiber reinforced composite materials

*Naoki Takano¹ (1. Department of Mechanical Engineering, Keio University)

3:50 PM - 4:10 PM

[250306-11-02]

Uncertainty modeling of time/space dependent boundary conditions in the 3D heat equation applied to quenching process simulation

*Esteban Antier¹, Naoki Takano² (1. Graduate School of Science and Technology, Keio University, 2. Department of Mechanical Engineering, Keio University)

4:10 PM - 4:30 PM

[250306-11-03]

Risk analysis by analyzing tail distribution of QoI in stochastic simulation

*Rikuto Karasudani¹, Naoki Takano² (1. Graduate School of Science and Technology, Keio University, 2. Department of Mechanical Engineering, Keio University)

4:30 PM - 4:50 PM

[250306-11-04]

Analysis of structural fire response of metro shield tunnel considering existing damage uncertainty

*Tongsheng Yu¹, Zhiguo Yan¹ (1. Department of Geotechnical Engineering, Tongji University)

4:50 PM - 5:10 PM

[250306-11-05]

Quantification of Numerical Error with Physics Informed Neural Network

*Adhika Satyadharma¹, Heng-Chuan Kan², Ming-Jyh Chern¹, Chun-Ying Yu¹ (1. National Taiwan University of Science and Technology, 2. National Center for High-performance Computing, National Applied Research Laboratories)

5:10 PM - 5:30 PM

[250306-11-06]

Multiscale damage development/strength analysis of filament winding CFRP with microscopic manufacturing defects

*Shuma Anzawa¹, Tetsuya Matsuda¹, Naoki Morita¹, Tomohiro Yokozeki², Ryoma Aoki², Masahito Ueda³, Wataru Iwase⁴ (1. University of Tsukuba, 2. The University of Tokyo, 3. Nihon University, 4. Motherson Yachiyo Automotive Systems Co., Ltd.)**[250401-05] MS-20-1****Simulation-based Disaster Prediction and Mitigation****1:00 PM - 3:00 PM****Room 504****Chairman:****TBA**

1:00 PM - 1:40 PM

[250401-05-01]

Thermodynamics-based Model-free Data-driven Landslide Modeling

*Jiun-Shyan Chen^{1,4}, Yanran Wang¹, Xiaolong He², Jacob Koester³, Kuan-Chung Lin⁴ (1. University of California San Diego, 2. ANSYS Inc, 3. Aperi Computational Mechanics Consulting, LLC, 4. National Cheng Kung University)

1:40 PM - 2:00 PM

[250401-05-02]

Enhanced semi-implicit MPM for seepage slope failure analysis

*Soma Hidano¹, Reika Nomura¹, Shuji Moriguchi¹, Kenjiro Terada¹
(1. Tohoku University)

2:00 PM - 2:20 PM

[250401-05-03]

Comparison of boundary enforcement methods for seismic wave absorption in Material Point Method simulations

*Connor Geudeker¹, Bodhinanda Chandra¹, Jun Kurima², Kenichi Soga¹ (1. University of California, Berkeley, 2. The University of Tokyo)

2:20 PM - 2:40 PM

[250401-05-04]

Simulation of Large woody debris using a driftwood model with cylinder model in distinct element method

*Taishi Tatsukawa¹, Toshiyuki Horiguchi¹ (1. National Defence Academy)

2:40 PM - 3:00 PM

[250401-05-05]

Development and validation of an implicit material point method solver with benchmark analyses of triaxial tests

*Yudai Takegawa¹, Yuki Kurakami¹, Kohei Murotani¹, Higo Yosuke² (1. Railway Technical Research Institute, 2. Kyoto University)

[250406-10] MS-20-2

Simulation-based Disaster Prediction and Mitigation

3:30 PM - 5:30 PM

Room 504

Chairman:

TBA

3:30 PM - 3:50 PM

[250406-10-01]

VC-enhanced RK-MPM for Microcracks Informed Damage Modeling on Brittle Solids via a Model-Based Neural Network Approach

*Tsung-Hui Alex Huang¹, Yu-Chun Chou¹, Sung-Han Yu¹ (1. National Tsing Hua University)

3:50 PM - 4:10 PM

[250406-10-02]

Development and verification of a dynamic fracture simulation method for concrete structures using an extended RBSM considering large rotation and fragment collision

*Kanto Kimura¹, Yoshihito Yamamoto¹ (1. Hosei University)

4:10 PM - 4:30 PM

[250406-10-03]

Physics-Informed Neural Networks for Landslide Simulation and Material Modeling

*Kuan-Chung Lin¹, Chieh-Ming Hsu¹ (1. National Cheng Kung University)

4:30 PM - 4:50 PM

[250406-10-04]

Finite Element Informed Neural Networks (FEINN) for Solid Mechanics Problems

*Siew Jau Ling¹, Ming-Jyun Dai¹ (1. National Cheng Kung University)

4:50 PM - 5:10

[250406-10-05]

An Enhanced Artificial Viscosity Stabilization for the Material Point Method in Modeling Compressible Air Flow and Air-

Structure Interaction with Shocks

*Sreehari Peddavarapu¹, Tsung-Hui Alex Huang¹ (1. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan)

[240201-05] MS-22-1

Innovative CAE for Vehicle Development and Cross-Industry Applications toward Safety and Sustainability

1:00 PM - 3:00

PM Room 402

Chairman:

Chenguang Lai (Chongqing University of Technology)

1:00 PM - 1:40 PM

[240201-05-01]

AI-Enhanced Closure Coefficients for RANS Simulations of the DrivAer Model

*Philipp Schlichter¹, Jutta Pieringer², Thomas Indinger¹ (1. Chair of Aerodynamics and Fluid Mechanics, Technical University of Munich, Germany, 2. AUDI AG Ingolstadt, Germany)

1:40 PM - 2:00 PM

[240201-05-02]

Development of a Robust Reduced-Order Turbulence Model for Vehicle Body Shape Changes

*Kazuto Ando^{1,2}, Rahul Bale^{1,2}, Akiyoshi Kuroda¹, Makoto Tsubokura^{1,2} (1. RIKEN Center for Computational Science, 2. Kobe University)

2:00 PM - 2:20 PM

[240201-05-03]

Investigation of the impact of physical information on the accuracy of 3D-CNN surrogate model for vehicle aerodynamic simulation

*TAICHI OKAMOTO¹, Takuji NAKASHIMA¹, Takenori HIRAOKA¹, Kohei SEO², Yusuke NAKAMURA², Keigo SHIMIZU², Hidemi MUTSUDA¹ (1. Hiroshima University Graduate School of Advanced Science and Engineering, 2. Technical Research Center, Mazda Motor Corporation)

2:20 PM - 2:40 PM

[240201-05-04]

Aerodynamic Analysis of VTOL Drone Using Coupled Simulations with Hierarchical Cartesian Mesh

*Ayato Takii¹, Yudai Hirai¹, Takateru Urakubo¹, Chihiro Kikumoto², Kousuke Suzuki², Makoto Tsubokura^{1,3} (1. Kobe University, 2. Aerosense Inc., 3. RIKEN Center for Computational Science)

2:40 PM - 3:00 PM

[240201-05-05]

Multi-objective optimization of ducted rotor shape for flying cars
Zirui Wang^{1,2,3}, Jingyu Wang^{1,2,3}, Yu Liu^{1,2,3}, *Xingjun Hu^{1,2,3}, Keyuan Shi^{1,2,3}, Peng Guo^{1,2,3}, Zirui Wang^{1,2,3}, Yulong Lei^{1,2,3}, Tianming Yu^{1,2,3} (1. College of Automotive Engineering, Jilin University, 2. National Key Laboratory of Automotive Chassis Integration and Bionics, 3. Institute of Automotive Aerodynamics)

[240206-10] MS-22-2**Innovative CAE for Vehicle Development and Cross-Industry Applications toward Safety and Sustainability****3:30 PM - 5:30 PM****Room 402****Chairman:****Thomas Indinger (Technical University of Munich)**

3:30 PM - 4:10 PM

[240206-10-01]

RESEARCH ON SINGLE-PHASE HEAT TRANSFER PERFORMANCE OF MANIFOLD MICROCHANNEL WITH TOPOLOGY DESIGN

*Shuai Feng¹, Xin Li¹, Jie Song¹ (1. Chongqing University of Technology)

4:10 PM - 4:30 PM

[240206-10-02]

High-resolution topology optimization of instrument panel beams under plate manufacturing constraints

*Yuji Wada¹, Takeshi Kashiya², Kei Nagasaka², Koji Nishiguchi^{3,4}, Shigenobu Okazawa⁵, Makoto Tsubokura^{6,4} (1. Institute of Science Tokyo, 2. Suzuki Motor Corporation, 3. Nagoya University, 4. RIKEN, 5. University of Yamanashi, 6. Kobe University)

4:30 PM - 4:50 PM

[240206-10-03]

Investigation and modeling of vehicle exterior impressions toward a multi-objective shape optimization for automotive aerodynamics and styling

*Keigo Shimizu¹, Ryota Mizoguchi², Takuji Nakashima², Takenori Hiraoka², Takahide Nouzawa², Iwao Koizumi², Asahi Kawasaki³, Kohei Seo¹, Akira Oyama⁴, Makoto Tsubokura^{3,5} (1. Mazda Motor Corporation, 2. Hiroshima University, 3. Kobe University, 4. Japan Aerospace Exploration Agency, 5. RIKEN, Center for Computational Science)

4:50 PM - 5:10 PM

[240206-10-04]

Multi-objective aerodynamic shape optimization of automobiles using shape morphing based on the proportioning characteristics of production vehicles

*Takui NAKASHIMA¹, Asahi KAWASAKI², Rahul BALE^{2,3}, Keigo SHIMIZU⁴, Ryota MIZOGUCHI¹, Takenori HIRAOKA¹, Takahide NOUZAWA¹, Iwao KOIZUMI¹, Akira OYAMA⁵, Makoto TSUBOKURA^{2,3} (1. Hiroshima University, 2. Kobe University, 3. RIKEN R-CCS, 4. Mazda Motor Corporation, 5. JAXA)

5:10 PM - 5:30 PM

[240206-10-05]

Sensitivity Analysis and Shape Optimization of Autonomous Vehicle Platoons Using the Adjoint Method

*Haochen Shuang¹ (1. Hiroshima University Graduate School of Advanced Science and Engineering)**[240701-04] MS-24-1****High Performance Computing for Environmental Problems****1:00 PM - 3:00 PM****Room 407****Chairman:****Takashi Shimokawabe (The University of Tokyo)**

1:00 PM - 1:20 PM

[240701-04-01]

A study of a conversation system with a specific person using a

database

*RUIYAN ZHU¹, Ryuji Shioya¹, Yasushi Nakabayashi¹ (1. Toyo University)

1:20 PM - 1:40 PM

[240701-04-02]

Predicting Oil-Immersed Transformer's Lifetime Using DGA Time Series Data

Hongjie Zheng¹, *Ryuji Shioya¹ (1. Toyo University)

1:40 PM - 2:00 PM

[240701-04-03]

The Development of AI-Based Motion Pictogram Generation and Effects on Visual Understanding

*Natsumi Okatani¹, Shioya Ryuji¹, Yasushi Nakabayashi¹ (1. Toyo University)

2:00 PM - 2:20 PM

[240701-04-04]

Accelerating stencil computation by using Tensor Core

*ZIHENG YUAN¹, Shimokawabe Takashi² (1. Department of Electrical Engineering and Information Systems Graduate School of Engineering, The University of Tokyo, 2. Information Technology Center, The University of Tokyo)**[240705-08] MS-24-2****High Performance Computing for Environmental Problems****3:30 PM - 5:30 PM****Room 407****Chairman:****Thomas Indinger (Technical University of Munich)**

3:30 PM - 3:50 PM

[240705-08-01]

A study on quantum simulation of nonlinear reaction-diffusion equations using Schrodingerization

*Shoya Sasaki¹, Katsuhiro Endo², Mayu Muramatsu¹ (1. Keio University, 2. National Institute of Advanced Industrial Science and Technology (AIST))

3:50 PM - 4:10 PM

[240705-08-02]

Asynchronous parallel search using Bayesian optimization for input parameters enabling nonlinear finite element analysis

*Takuto Nimura¹, Yasunori Yusa¹ (1. The University of Electro-Communications)

4:10 PM - 4:30 PM

[240705-08-03]

Structure-Borne Noise Induced by Train Passage on a Steel Box Bridge: Analysis Using a Unified Solver and Experimental Validation

*Hua-Yu Lee¹, Wei-Lun Hsu² (1. Institute of Applied Acoustics Dept. of Systems Engineering and Naval Architecture, National Taiwan Ocean University, 2. Dept. of Systems Engineering and Naval Architecture, National Taiwan Ocean University)

4:30 PM - 4:50 PM

[240705-08-04]

Scalability Analysis of an In-House CFD Solver Using the OpenMP for Modeling VIV Circular Cylinder in Turbulent Flow

*Agus Suandi¹ (1. Department of Mechanical Engineering, National Taiwan University of Science and Technology)

Thu. Jul 3, 2025**Plenary Lecture****9:00 AM – 10:00 AM****Room 301**

[330101-01] Recent Advances in Nonlocal Methods for Computational Mechanics

Prof. Jung-Wuk Hong (Korea Advanced Institute of Science and Technology)

Chairman:

Michael Kaliske (Technische Universität Dresden)

Semi-Plenary Lecture**10:20 AM – 11:00 AM****Room 501**

[350101-01] Advances in Variational Multiscale Methods for Optimizing Wind and Marine Energy Systems

Prof. Artem Korobenko (University of Calgary)

Chairman:

Antonia Larse (Università degli Studi di Padova)

10:20 AM – 11:00 AM**Room 502**

[350201-01] Earthquake simulation enhanced by high-performance computational science

Prof. Tsuyoshi Ichimura (The University of Tokyo)

Chairman:

Leszek Demkowicz (The University of Texas at Austin)

11:00 AM – 11:40 AM**Room 501**

[350102-02] Landslide hazard assessment under changing climate conditions Landslide hazard assessment under changing climate conditions

Prof. Shabnam J. Semnani (University of California, San Diego)

Chairman:

Antonia Larse (Università degli Studi di Padova)

11:00 AM – 11:40 AM**Room 502**

[350202-02] Digital Twins for Smart Disaster Prevention and Automatically Executing Disaster Simulations

Prof. Satoru Oishi (Kobe University)

Chairman:

Leszek Demkowicz (The University of Texas at Austin)

Oral Presentation**[350501-06] MS-01-3****Combustion Simulations for Safety and Environmental Problems****1:00 PM – 3:00 PM****Room 505****Chairman:****Yuji Nakamura (Toyoashi University of Technology)**

1:00 PM – 1:20 PM

[350501-06-01]

Flame acceleration and possibility of deflagration-to-detonation transition in unconfined turbulent flow: 2D axisymmetric simulation of H₂-O₂ flame at elevated pressures*Kazuya Iwata¹, Sho Wada^{2,1}, Ryoichi Kurose¹ (1. Kyoto University, ². Stanford University)

1:20 PM – 1:40 PM

[350501-06-02]

Detonative wavelets in quasi-detonations with fine coal char particles

*Juntang Zhang¹, Huangwei Zhang¹ (1. National University of Singapore)

1:40 PM – 2:00 PM

[350501-06-03]

Numerical study of thermal degradation and ignition behavior for rigid polyurethane foam with multi-layer sandwich structures

*Xinyang Wang¹, Lizhong Yang¹, Xiaoyu Ju¹ (1. State Key Laboratory of Fire Science, University of Science and Technology of China, Jin Zhai Road 96, Hefei, Anhui, 230026 China)

2:00 PM – 2:20 PM

[350501-06-04]

Numerical investigation on the formation and development process of the mushroom cloud from the atomic bombing of Nagasaki

*Kenta Nakajima¹, Akiko Matsuo¹ (1. Keio University)

2:20 PM – 2:40 PM

[350501-06-05]

Numerical prediction on behavior of radioactive cesium transported by combustion gas flow in a municipal solid waste incinerator

*Kazuyuki Takase¹, Kazuaki Kusakabe¹ (1. Fukushima Prefectural Centre for Environmental Creation)

2:40 PM – 3:00 PM

[350501-06-06]

Modelling blow-off extinction by air vortex ring: entrainment induced fuel dilution and convective cooling

*Sainan Quan^{1,2}, Caiyi Xiong¹, Xinyan Huang² (1. School of Mechanical & Automotive Engineering, South China University of Technology, Guangzhou, China, 2. Department of Building Environment & Energy Engineering, The Hong Kong Polytechnic University, Hong Kong, China)**[350406-09] MS-02-1****Computational Methods for Water Environmental Problems and Coastal/Flood Disaster Mitigation****3:30 PM – 5:30 PM****Room 504****Chairman:****Kazuo Kashiwara (Chuo University)**

3:30 PM – 4:10 PM

[350406-09-01]

Towards a modeling framework for cascading hazards of earthquake-induced land subsidence and coastal flooding

*Ethan John Kubatko¹, Patrick Bassal¹, Derek Sawyer¹, Aaron Sines¹, Suranjan Nepal¹, Paola Rivera Soto² (1. The Ohio State University, 2. University of Puerto Rico)

4:10 PM – 4:30 PM

[350406-09-02]

Locally Adaptive Non-Hydrostatic Extension for Shallow Water Equations: Application to Moving Bottom-Generated Waves

*Kemal Firdaus^{1,2}, Jorn Behrens^{1,2} (1. Department of Mathematics, Universität Hamburg, Bundesstrasse 53-55, 20146 Hamburg, Germany, 2. Center for Earth System Research

and Sustainability (CEN), Universitat Hamburg ,
Bundesstrasse 53-55, 20146 Hamburg, Germany)

4:30 PM - 4:50 PM

[350406-09-03]

The Missing Link in Flood Inundation Models: High-Resolution
Terrain Data and Its Accuracy Impact on Kabul River,
*Abdul Naser Asil¹, tsunakio iribe² (1. master second year
student , 2. university professor)

4:50 PM - 5:10 PM

[350406-09-04]

High order asymptotic preserving WENO schemes for rotating
shallow water equations
*Yulong Xing¹ (1. Ohio State University)

[340605-09] MS-03-1

**Advances in Hypercomplex disaster simulation and
modeling**

3:30 PM - 5:30 PM

Room 406

Chairman:

Seizo Tanaka (Hiroshima Institute of Technology)

3:30 PM - 4:50PM

3:30 PM - 3:50 PM

[340605-09-02]

Earthquake induced slope failure patterns of embankment
reinforced by nailing and frame simulated using Particle-
Element coupled Method
*Takatoshi Kiriya¹, Kiyoshi Fukutake² (1. Shimizu
Corporation, 2. Osaki Research Institute)

3:50 PM - 4:10 PM

[340605-09-03]

Sequential updating of building fragility functions through
large-scale seismic simulations and sensor integration
*Dongyang Tang¹, Sukulthanasorn Naruethap¹, Reika Nomura¹,
Kazuya Nojima³, Atsushi Mori³, Susumu Ohno¹, Jia Guo², Seiichi
Sato³, Shuji Moriguchi¹, Masaaki Sakuraba³, Kenjiro Terada¹ (1.
Tohoku University, 2. Kyoto University, 3. Nippon Koei Co., Ltd)

4:10 PM - 4:30 PM

[340605-09-04]

Multihazard framework for regional-scale simulation of rain-
induced flood and landslide disasters
*Nilo Lemuel Junio Dolojan¹, Takayuki Takahashi¹, Masakazu
Hashimoto², Akihiro Shibayama¹, Reika Nomura¹, Kenjiro Terada¹,
Shuji Moriguchi¹ (1. Tohoku University, 2. Kansai University)

4:30 PM - 4:50 PM

[340605-09-05]

Strain-rate dependent shear resistance model for debris flow
simulations in 2D shallow water equation
*Reika Nomura¹, Chiho Otsuka¹, Soma Hidano¹, Nilo Lemuel
Dolojan¹, Shuji Moriguchi¹, Takeshi Kodaka², Kenjiro Terada¹ (1.
Tohoku University, 2. Meijo University)

[350103-08] MS-05-3

**Novel Numerical Methods and Multi-Approach Strategies
in Computational Mechanics**

1:00 PM - 3:00 PM

Room 501

Chairman:

Naoki Morita (University of Tsukuba)

1:00 PM - 1:20 PM

[350103-08-01]

Flow Analysis with an Interface-Capturing Technique Using
Neural Implicit Functions
*Takumi Nemoto¹, Nozomi Magome¹, Akinari Tsukamoto¹, Ming-
Chen Hsu², Naoto Mitsume¹ (1. University of Tsukuba, 2. Iowa
State University)

1:20 PM - 1:40 PM

[350103-08-02]

An Interface-Capturing Acoustic Analysis with Neural Implicit
Fields
*Naoto Mitsume¹, Akinari Tsukamoto¹, Nozomi Magome¹, Naoki
Morita¹, Ming-Chen Hsu² (1. University of Tsukuba, 2. Iowa State
University)

1:40 PM - 2:00 PM

[350103-08-03]

Numerical Simulation of Coating Damage under High-Speed
Particle Impact: A CFD-DEM Model and Wear Prediction Method
*Zihao Li¹, Naoto Mitsume¹, Shunhua Chen² (1. University of
Tsukuba, 2. Sun Yat-sen University)

2:00 PM - 2:20 PM

[350103-08-04]

Image-data-driven flow simulation
*Nobuyuki Oshima¹, Nobuto Nakamichi¹, Younghwa Cho¹ (1.
Hokkaido university)

2:20 PM - 2:40 PM

[350103-08-05]

Precise Boundary Representation in Multimaterial Topology
Optimization
*Yi Cui¹, Rika Tsuji¹, Toshiro Matsumoto¹ (1. Nagoya University)

2:40 PM - 3:00 PM

[350103-08-06]

Three-dimensional seismic collapse simulation of irregular
bridges using an implicit dynamic analysis procedure
*Muhammad Ali Rofiq^{1,2}, Tzu Ying Lee¹ (1. National Central
University, 2. Universitas Muhammadiyah
Surakarta)

[350109-13] MS-05-4

**Novel Numerical Methods and Multi-Approach Strategies
in Computational Mechanics**

3:30 PM - 5:30 PM

Room 501

Chairman:

Shigeki Kaneko (Nagoya Institute of Technology)

3:30 PM - 4:10 PM

[350109-13-01]

New Framework of a dense EVD solver by Mixed-precision
Iterative Refinement Scheme
*Toshiyuki Imamura¹, Yuki Uchino¹, Qianxiang Ma¹,
Takeshi Terao² (1. RIKEN, 2. Kyushu University)

4:10 PM - 4:30 PM

[350109-13-02]

3D Generative AI Based on DeepSDF: Training and Evaluation with a Dataset of 21,998 Eulerian Elastoplastic Simulations

*Koji Nishiguchi^{1,2}, Issei Toida¹, Naoya Chiba³, Junji Kato¹ (1. Nagoya University, 2. RIKEN, 3. University of Osaka)

4:30 PM - 4:50 PM

[350109-13-03]

The hydrodynamic effects of a swimming blue shark by the 6 DOF FSI approach

*Yun Hsin Lin¹, Che Wei Tsao¹, Wei Hsiang Wang¹ (1. National Chung Hsing University)

4:50 PM - 5:10 PM

[350109-13-04]

Development of a Defect Estimation Method for Carbon Fiber Reinforced Plastic Interstage Structures with Holes in Space Transportation Systems Using Finite Element Analysis and Graph Neural Networks

*Keisuke Nishioka¹, Yuta Kojima¹, Toshiya Saito², Masahito Washiya², Kosuke Kawakami², Mitsuo Matsunaga², Mayu Muramatsu¹ (1. Keio University, 2. Japan Aerospace Exploration Agency)

5:10 PM - 5:30 PM

[350109-13-05]

Deep Learning for 3D Shape Generation with Structural Mechanics and Thin-Plate Considerations

*Sora Takanezawa¹, Koji Nishiguchi¹, Keiichi Yonehara², Shigeki Kojima², Kosho Kawahara² (1. Nagoya University, 2. TOYOTA MOTOR CORPORATION)**[340301-06] MS-06-3****Multiscaling for Safety and Environmental Problems****1:00 PM - 3:00 PM****Room 403****Chairman:****Akiyuki Takahashi (Tokyo University of Science)**

1:00 PM - 1:20 PM

[340301-06-01]

Algorithm of Polyhedral Mesh Generation with Surface Reconstruction for Complex Geometry and Its Applications

*Jongyeop Kim¹, Yi Yu², Kyoungsoo Park¹ (1. Yonsei University, 2. University of Porto)

1:20 PM - 1:40 PM

[340301-06-02]

Effect of modeling interfacial transition zone (ITZ) of concrete on evaluated properties from fluid-solid coupled analysis

Donghwi Eum¹, Se-Yun Kim¹, *Tong-Seok Han¹ (1. Yonsei University)

1:40 PM - 2:00 PM

[340301-06-03]

Investigation of void characteristics and properties of 3D printing concrete using micro-CT

*Ji-Su Kim¹, Chanho Yoo¹ (1. University of Seoul)

2:00 PM - 2:20 PM

[340301-06-04]

Shaking table tests of a small-scale system of metafoundation and its numerical verification to mitigate vibrations due to seismic waves

*Jin Ho Lee¹, An M.N. Nguyen¹, Pham M. Truong¹, Hieu V. Nguyen¹

(1. Pukyong National University)

2:20 PM - 2:40 PM

[340301-06-05]

An EB-PML for transient simulation of flexural waves in the time domain

*Hongju Kim¹, Jun Won Kang¹ (1. Hongik University)

2:40 PM - 3:00 PM

[340301-06-06]

A spectrogram-based CNN model for subsurface imaging of unbounded domains

*Hyeok jun Kwon¹, Jun Won Kang¹ (1. Hongik University)**[340307-11] MS-06-4****Multiscaling for Safety and Environmental Problems****3:30 PM - 5:30 PM****Room 403****Chairman:****Tong-Seok Han (Yonsei University)**

3:30 PM - 3:50 PM

[340307-11-01]

Data Assimilation for Dislocation Behavior in Dislocation Dynamics Simulations Based on the Ensemble Kalman Filter

*Hiroki Murata¹, Shiro Ihara², Katsuhiko Endo³, Mayu Muramatsu¹ (1. Keio University, 2. Kyushu University, 3. National Institute of Advanced Industrial Science and Technology (AIST))

3:50 PM - 4:10 PM

[340307-11-02]

Dislocation dynamics analysis of dislocation-precipitate interactions in small volumes

*Hiroki Saito¹, Atsuo Hirano¹, Akiyuki Takahashi¹ (1. Tokyo University of Science)

4:10 PM - 4:30 PM

[340307-11-03]

Dislocation dynamics analysis of the influence of off-angle on basal plane dislocation behavior in 4H-SiC

*Noboru Takahashi¹, Atsuo Hirano¹, Akiyuki Takahashi¹ (1. Tokyo University of Science)

4:30 PM - 4:50 PM

[340307-11-04]

A multiscale modeling strategy for diffusional creep mechanisms: Application to Coble creep deformation

*Yi Liu¹, Kota Sagara¹, Kazuki Shibamura¹ (1. The University of Tokyo)

4:50 PM - 5:10 PM

[340307-11-05]

A model for quantitatively predicting Coble creep deformation and void nucleation/growth in three-dimensional polycrystalline solids

*Kota Sagara¹, Yi Liu¹, Kazuki Shibamura¹ (1. The University of Tokyo)

[350203-07] MS-07-3**Multiscale modeling and multiscale analysis for computational materials and engineering applications****1:00 PM - 3:00 PM****Room 502****Chairman:****Tung-Yu Wu (National Taiwan University)**

1:00 PM - 1:40 PM

[350203-07-01]

A time-dependent collocation framework for multi-phase coupling problems

*Judy P. Yang¹, Yu-Ruei Chen¹ (1. National Yang Ming Chiao Tung University)

1:40 PM - 2:00 PM

[350203-07-02]

Effects of internal length scales on the mechanical behavior of chiral Cosserat materials under high loading rates

*Yunche Wang¹, Wan-Chun Lo¹, Cheng-Wei Mai¹, Yasothorn Sapsathiarn² (1. National Cheng Kung University, 2. Mahidol University)

2:00 PM - 2:20 PM

[350203-07-03]

Dispersion analysis of cellular materials with size effect

*Yuh-Hao Hung¹, Zhen-En Jian¹, Li-Wei Liu¹ (1. Department of Civil Engineering, National Taiwan University)

2:20 PM - 2:40 PM

[350203-07-04]

YO-SAM2: A Novel Approach to Automated Cobb Angle Measurement in Scoliosis Diagnosis

*CHIH-YI Harper LU¹, CHUN-YI HSIEH², CHI-KUANG FENG³, I-YUN Lisa HSIEH^{1,4} (1. Department of Civil Engineering, National Taiwan University, 2. Division of Pedodontics, Department of Stomatology, Taipei Veterans General Hospital, 3. Department of Orthopaedics and Traumatology, Taipei Veterans General Hospital, 4. Department of Chemical Engineering, National Taiwan University)

2:40 PM - 3:00 PM

[350203-07-05]

Classification of Mild Cognitive Impairment and Alzheimer's Disease with Handwriting Dynamic Features from Multiple Chinese Character Writing Tasks

*Ching-Wei Ye¹, Mong-Jen Kuo¹, Shu-Wei Chang², Chien-Liang Liu³, Tsai-Yu Shih¹, Tien-Ni Wang^{1,4}, Hao-Ling Chen^{1,4} (1. School of Occupational Therapy College of Medicine, National Taiwan University, 2. Department of Civil Engineering, National Taiwan University, 3. Department of Neurology, Taipei City Hospital, 4. Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital)**[350208-11] MS-07-4****Multiscale modeling and multiscale analysis for computational materials and engineering applications****3:30 PM - 5:30 PM****Room 502****Chairman:****Judy P. Yang (National Yang Ming Chiao Tung University)**

3:30 PM - 3:50 PM

[350208-11-01]

Experimental and Numerical Investigations on Dual-Mass Resonant Seismic Metamaterials

Nathan W. Halim¹, *Tung-Yu Wu¹, Shiang-Jung Wang² (1. National Taiwan University, 2. National Taiwan University of Science and Technology)

3:50 PM - 4:10 PM

[350208-11-02]

Stochastic Estimation of Stiffness/Strength for Polycrystalline Materials

*Tin Cong Le¹, Fumiya Tsujii¹, Tatsuya Fujise¹, Kazumi Matsui¹, Takahiro Yamada¹ (1. Yokohama National University)

4:10 PM - 4:30 PM

[350208-11-03]

Unraveling the mechanism of molecular structure and interaction of gellan gum molecules in bioengineering applications

Wei-Yuan Chiu¹, Jiasheng Yu¹, *Chia-Ching Chou¹ (1. National Taiwan University)

4:30 PM - 4:50 PM

[350208-11-04]

The Effect of Sequence Environment on the Stability of Collagen Triple Helix with Glycine-to-Cysteine Mutation

*Kao Yun Chu¹, Shu Wei Chang^{1,2} (1. Department of Civil Engineering, National Taiwan University, 2. Department of Biomedical Engineering, National Taiwan University)**[340101-04] MS-08-3****Recent advances in impact and blast analyses****1:00 PM - 3:00 PM****Room 401****Chairman:****Yifei Hao (Hebei University of Technology)****Yusuke Kurihashi (Kanazawa University)**

1:00 PM - 1:40 PM

[340101-04-01]

Performance of origami metastructure filled with shear thickening fluid (OM-STF) against blast loads

Latin Lam¹, *Wensu Chen¹, Hong Hao^{2,1}, Zhejian Li² (1. Curtin University, 2. Guangzhou University)

1:40 PM - 2:00 PM

[340101-04-02]

Rationalization of the protective design against airplane impact

*Daiki Takahashi¹, Junji Tsujimura¹, Yukihiro Okuda², Akemi Nishida², Hiroshi Yamagata¹ (1. Nagaoka University of Technology, 2. Japan Atomic Energy Agency)

2:00 PM - 2:20 PM

[340101-04-03]

Study on dynamic fracture behavior of damaged concrete materials and beams

*Hiroki Tamai¹, Daisuke Yamamoto², Masuhiro Beppu³ (1. Kyushu University, 2. Oita National College of Technology, 3. National Defense Academy)

2:20 PM - 2:40 PM

[340101-04-04]

Machine Learning-Based Surrogate Modeling of Blast Parameters for Cuboid Explosive Charges

*Tae Hee Lee¹, Dawon Park¹, Yena Lee¹, Jung-Wuk Hong¹ (1. KAIST)

[340105-09] MS-08-4**Recent advances in impact and blast analyses****3:30 PM - 5:30 PM****Room 401****Chairman:****Masato Komuro (Muroran Institute of Technology)****Thong Pham (University of South Australia)**

3:30 PM - 3:50 PM

[340105-09-01]

Development of Meta-Blocks for Improved Energy Dissipation Capacity against Impact Loading

*Xihong Zhang¹, Nicolas Contreras¹, Hong Hao² (1. Curtin University, 2. Guangzhou University)

3:50 PM - 4:10 PM

[340105-09-02]

Fracture behavior simulations of film-laminated window glass subjected to colliding objects

*Yoichi Mukai¹, Haoyang Li¹, Yasunori Mizushima¹ (1. Kobe University)

4:10 PM - 4:30 PM

[340105-09-03]

Estimating Maximum Displacement of RC Beams Subjected to Impact Load Using HPC and AI

*Yusuke Kurihashi¹, Shion Kudo¹, Luong Thai Anh Duy¹ (1. Kanazawa University)

4:30 PM - 4:50 PM

[340105-09-04]

Applicability of DEM for Analyzing Damage Case of Steel Pipe Open Sabo Dams

*Toshiyuki Horiguchi¹ (1. National Defense Academy)

4:50 PM - 5:10 PM

[340105-09-05]

A study on aerosol explosion characteristics of hydrogen and gasoline spray mixtures

*Lingfeng He¹, Yong Hu¹, Ke Yu¹ (1. State Key Laboratory of Fire Science, University of Science and Technology of China)**[340501-04] MS-09-3****Recent Advances in Computational Fracture Mechanics and Failure Analysis****1:00 PM - 3:00 PM****Room 405****Chairman:****Hiroshi Okada (Tokyo University of Science)**

1:00 PM - 1:20 PM

[340501-04-01]

Study on finite strain elastoplastic crack propagation analysis using the redefined J-integral and J-integral range ΔJ *Koichiro Arai¹, Hiroshi Okada² (1. HEXAGON, 2. Tokyo University of Science)

1:20 PM - 1:40 PM

[340501-04-02]

A semi-analytical approach for a piezoelectric material with slant mode-III cracks

*Ying-Te Lee¹, Shyh-Rong Kuo¹ (1. National Taiwan Ocean University)

1:40 PM - 2:00 PM

[340501-04-03]

SPH simulation for inter-/intra-granular crack propagation in micro-cantilevers

*Sewon Jeon¹, Xuelong Lyu², Kazumi Matsui², Takahiro Yamada² (1. Graduate School of Environment and Information Sciences, Yokohama National University, 2. Faculty of Environment and Information Sciences, Yokohama National University)

2:00 PM - 2:20 PM

[340501-04-04]

Projectile Penetration Simulation in Thin Plate for Stainless Steel

*Jin-Ha Hwang¹, Yun-Jae Kim², Tomohisa Kumagai³ (1. Pukyong National University, 2. Korea University, 3. Central Research Institute of Electric Power Industry)**[340401-05] MS-10-3****Deep and Machine Learning Methodology in the Context of Application to Computational Mechanics****1:00 PM - 3:00 PM****Room 404****Chairman:****Yoshitaka Wada (Kindai University)**

1:00 PM - 1:20 PM

[340401-05-01]

GNN-Based Defect Detection Frameworks for Complex-Shaped CFRP Specimens Adaptable to Multiple Defect Shapes Based on Stress Distributions by Homogenized Finite Element Analysis

*Yuta Kojima¹, Julien Yvonnet², Yoshihisa Harada³, Mayu Muramatsu¹ (1. Keio university, 2. Gustave Eiffel University, 3. National Institute of Advanced Industrial Science and Technology)

1:20 PM - 1:40 PM

[340401-05-02]

Advanced structural material design based on computational simulation and data-driven method

*Zhanli Liu¹ (1. Tsinghua University)

1:40 PM - 2:00 PM

[340401-05-03]

Research on surrogate models for earthquake damage prediction using numerical analysis

*Sota Nishioka¹, Yuichiro Yamabe¹, Satoru Oishi¹ (1. Kobe University)

2:00 PM - 2:20 PM

[340401-05-04]

Learning Stochastic Dynamical Systems for Complex System Prognosis Using RRAEs.

*Jad Mounayer^{1,2}, Sebastian Rodriguez¹, Jerome Tomezyk², Chady Ghnatios³, Francisco Chinesta^{1,4} (1. ENSAM, 2. SKF Magnetic Mechatronics, 3. University of North Florida, 4. CNRS@CREATE)

2:20 PM - 2:40 PM

[340401-05-05]

Three-Dimensional Crack Propagation Prediction Using Transfer Learning

*Ryosuke Akimoto¹, Yoshitaka Wada¹ (1. Kindai University)

[340601-04] MS-11-3**Structural Optimization for Creating a Better Society****1:00 PM - 3:00 PM****Room 406****Chairman:****Junji Kato (Nagoya University)****Akihiro Takezawa (Waseda University)**

1:00 PM - 1:20 PM

[340601-04-01]

Structural Behavior of Ultra High Strength Fiber Reinforced Concrete Wind Tower Prestressed with CFRP Bars

*Mamy Andriatsitohaina RABOTOVAO¹, Tomohiro MIKI¹ (1. Kobe University, Graduate school of Engineering, Department of Civil Engineering)

1:20 PM - 1:40 PM

[340601-04-02]

Concurrent Topology Optimization for Energy Flow Control Based on the Poynting Vector

*Yuhao Bao¹, Zheng Ni¹, Xiaopeng Zhang¹ (1. Dalian University of Technology)

1:40 PM - 2:00 PM

[340601-04-03]

A B-scan imaging of concrete structures: An electrical impedance tomography approach

*Juhyeon Jo¹, Jun Won Kang¹ (1. Hongik University)

2:00 PM - 2:20 PM

[340601-04-04]

Mass constrained multi-material topology optimization applying quantum annealing

Kenshin Nakano¹, Hiroya Hoshiba¹, Koji Nishiguchi¹, *Junji Kato¹ (1. Nagoya University)**[340406-08] MS-13-1****Particle-Based Numerical Methods for Simulating Solid-Granular Interactions****3:30 PM - 5:30 PM****Room 404****Chairman:****TBA**

3:30 PM - 3:50 PM

[340406-08-01]

Impact and Erosion Dynamics of Inclusion-Enriched Dry Granular Flows on Rigid Barriers

with Basal Openings: Insights from Hybrid MP-DEM Simulations
*Yupeng Jiang¹, Clarence Choi² (1. IBNM, Leibniz University Hannover, 2. Department of Civil Engineering, The University of Hong Kong)

3:50 PM - 4:10 PM

[340406-08-02]

Towards high-fidelity modelling of solid-fluid mixtures displacing and burying objects: hybrid MPM-DEM modelling

*Minghe Wang¹, Clarence Edward Choi¹ (1. Department of Civil Engineering, The University of Hong Kong)

4:10 PM - 4:30 PM

[340406-08-03]

Continuum modeling of collisional restitution in dilative dense granular flows

*Bodhinanda Chandra¹, Ken Kamrin¹ (1. University of California, Berkeley)**[350306-10] MS-14-1****Meshless and Particle method for safety problems****3:30 PM - 4:10 PM****Room 503****Chairman:****Seiichi Koshizuka (University of Tokyo)**

3:30 PM - 4:10 PM

[350306-10-01]

Multi-scale SPH method for simulating tsunami propagation caused by submarine landslides

*Daniel Shiguo Morikawa¹, Mitsuteru Asai², Francisco Xavier³ (1. JAMSTEC, 2. Kyushu University, 3. University of Rio de Janeiro State)

4:10 PM - 4:30 PM

[350306-10-02]

SPH simulation of wave runup on ecological seawalls

*Yafei Yang¹, Xiuja Su¹, Min Luo¹, Abbas Khayyer² (1. Zhejiang University, 2. Kyoto University)

4:30 PM - 4:50 PM

[350306-10-03]

SH-wave scattering problem of an arbitrary shaped hill by using the boundary integral quadrature method

*Jia-Wei Lee¹, Yu-Wei Wang¹, Shing-Kai Kao², Jeng-Tzong Chen² (1. Department of Civil Engineering, Tamkang University, 2. Department of Harbor and River Engineering, National Taiwan Ocean University)

4:50 PM - 5:10 PM

[350306-10-04]

Computational cost reduction for SPH applying vertical coordinate transformation

*Shujiro Fujioka¹, Kumpei Tsuji², Naoto Mitsume³, Mitsuteru Asai¹ (1. Kyushu University, 2. Tohoku University, 3. University of Tsukuba)

5:10 PM - 5:30 PM

[350306-10-05]

Comparisons of Behavior for Simulations and Experiments of Spar Type Floating Wind Power Turbine by Particle Method

*Seiya Hagihara¹, Rikuto Ideta¹, Yuh Uchino¹, Satoyuki Tanaka², Shinya Taketomi¹, Yuichi Tadano¹ (1. Saga University, 2. Hiroshima University)**[340505-08] MS-15-1****Direct Computation of Safety Margins for Structures and Materials****3:30 PM - 5:30 PM****Room 405****Chairman:****Konstantinos Vassilios Spiliopoulos (National Technical University of Athens)**

3:30 PM - 3:50 PM

[340505-08-01]

Design for additive manufacturing: Direct method-based evaluation and optimization techniques applied to lightweight aircraft structures

*Geng Chen¹, Shengzhen Xin¹, Changxiong Huang¹, Konstantinos V. Spiliopoulos² (1. Beijing Jiaotong University, 2. National Technical University of Athens)

3:50 PM - 4:10 PM

[340505-08-02]

A computational framework for the direct estimation of asymptotic states of inelastic structures

*Konstantinos Vassilios Spiliopoulos¹ (1. National Technical University of Athens)

4:10 PM - 4:30 PM

[340505-08-03]

Predicting the safety margins of structures made from anisotropic materials via shakedown analysis

*Lilian Aurora Ochoa Ontiveros¹, Reza Vafadari Komarolia¹, Lavakumar Veludandi¹, Jaan Willem Simon¹ (1. Computational Applied Mechanics, University of Wuppertal)

4:30 PM - 4:50 PM

[340505-08-04]

Data-driven FEM cluster-based basis reduction method for shakedown analysis of heterogeneous material and structures under variable loads

*Yinghao Nie¹, Xiuchen Gong¹, Qian Zhang¹, Gengdong Cheng^{1,2} (1. Dalian University of Technology, 2. State Key Laboratory of Structural Analysis, Optimization and CAE Software for Industrial Equipment)

[330102-07] MS-16-3

Advances in Numerical Methods for Enhancing Safety and Resilience of Structures in Civil and Architectural Engineering

1:00 PM - 3:00 PM

Room 301

Chairman:

Leong Hien Poh (National University of Singapore)

1:00 PM - 1:20 PM [330102-07-01]

Effect of frictional pot bearing defects on the seismic vulnerability assessment of girder bridges

*Dongho Kim¹, Jun Won Kang¹ (1. Hongik University)

1:20 PM - 1:40 PM

[330102-07-02]

Reanalysis of support structures for jacket-type offshore wind turbines

*Shih-Hsun Yin¹ (1. Department of Civil Engineering, National Taipei University of Technology)

1:40 PM - 2:00 PM

[330102-07-03]

Repairing simulation assessing strength recovery of damaged transmission tower under different seasonal loads and support movement

*Yuto Yamano¹, Kumpei Tsuji¹, Hiroki Mizoe², Tasuku Muroi³, Yuki Yamakawa¹ (1. Department of Civil and Environmental Engineering, Tohoku University, 2. Carbon Neutrality and Power Plants Engineering, Research and Development Center, Tohoku Electric Power Co., Inc., 3. Power Transmission Division, Sendai Power Network Center, Tohoku Electric Power Network Co., Inc.)

2:00 PM - 2:20 PM

[330102-07-04]

Investigation of internal pressure capacity of prestressed concrete containment vessel under a severe accident

*Sangwoo Lee¹, Hoyoung Son¹, Bu-Seog Ju¹, Yoon-Suk Chang¹ (1. Kyunghee university, Republic of Korea)

2:20 PM - 2:40 PM

[330102-07-05]

A viscoelastoplastic model of asymmetric building structures and its application in seismic analysis

*Li-Wei Liu¹, Hao-Cheng Peng¹, Cheng-Yuan Chen¹ (1. National Taiwan University)

2:40 PM - 3:00 PM

[330102-07-06]

Reliability assessment of deep excavation support for implementing Digital Twin

*Menaka Kanagalingam¹, G. L. Sivakumar Babu² (1. Post Doctorate Fellow, Indian Institute of Science Bangalore, 2. Professor, Indian Institute of Science Bangalore)

[330108-12] MS-16-4

Advances in Numerical Methods for Enhancing Safety and Resilience of Structures in Civil and Architectural Engineering

3:30 PM - 5:30 PM

Room 301

Chairman:

Takuzo Yamashita (National Research Institute for Earth Science and Disaster Resilience)

3:30 PM - 4:10 PM

[330108-12-01]

A reduced order modelling approach for alternative load path analysis of reinforced concrete structures

Yu Chen¹, *Leong Hien Poh¹ (1. National University of Singapore)

4:10 PM - 4:30 PM

[330108-12-02]

Bespoke machine learning framework for solving structural engineering problems using graph neural networks: Toward specialized AI

*Kazuki Hayashi¹ (1. Kyoto University)

4:30 PM - 4:50 PM

[330108-12-03]

Baffle Characteristics Optimization of Rectangular And Prismatic Tank Using Surrogate Model And CFD Simulation

Nghiep Chan Nguyen¹, Tuong Vi Thi Quang¹, Anh Viet Nguyen¹, Nam Ha Tran¹, *Dianxiang Xiang¹ (1. TechnoStar Co., Ltd.)

4:50 PM - 5:10 PM

[330108-12-04]

Surrogate model for nonlinear response-history analysis and multi-objective design optimization of base-isolated reinforced concrete buildings

*I-HSIANG CHANG¹, Kuang-Yao Li¹, Wei-Tze Chang², Chuin-Shan Chen¹, Yin-Nan Huang¹ (1. National Taiwan University, 2. National Center for Research on Earthquake Engineering)

5:10 PM - 5:30 PM

[330108-12-05]

Cross-section design optimization of steel buildings using graph-based reinforcement learning and nonlinear response-history analysis

*Kuang-Yao Li¹, I-Hsaing Chang¹, Wei-Tze Chang², Yin-Nan Huang¹, Chuin-Shan Chen¹ (1. National Taiwan University, 2. National Center for Research on Earthquake Engineering)

[350301-05] MS-17-3**Stochastic simulation, uncertainty quantification, verification and validation****1:00 PM - 3:00 PM****Room 503****Chairman****Naoki Takano (Keio University)**

1:00 PM - 1:20 PM

[350301-05-01]

Validation experiment and simulation for reinforced concrete beams

*Mao Kurumatani¹, Junki Hanyu¹, Eigo Watanabe¹, Yohta Kawachi¹, Hideyuki Sakurai² (1. Ibaraki University, 2. Shimizu Corporation)

1:20 PM - 1:40 PM

[350301-05-02]

Potential Seismic Damage in the Near-Fault Regions of the Southeastern Korean Peninsula

*Reza Sharbati¹, Dong Youp Kwak² (1. Postdoctoral Researcher, Department of Civil and Environmental Engineering, Hanyang University ERICA, South Korea, 2. Associate Professor, Department of Civil and Environmental Engineering, Hanyang University ERICA, South Korea)

1:40 PM - 2:00 PM

[350301-05-03]

Numerical verification procedure for dynamic problems of elastic solid structure

*Takahiro Yamada¹ (1. Yokohama National University)

2:00 PM - 2:20 PM

[350301-05-04]

A revisit on comparison between simulation and experiment responses in VVUQ process

*Tomohiko Morimo^{1,2}, Megumi Oishi², Chikako Natsumeda², Kazumi Matsui², Kazuyuki Kurata³, Yuki Fukutani⁴, Arata Tsuzuki⁵, Takahiro Miura⁶, Takashi Inoue⁷, Hirofumi Sugiyama⁸, Takeki Yamamoto⁹, Dai Watanabe¹⁰, Xuelong Lyu², Takahiro Yamada² (1. Gifu Prefecture Research Institute for Human Life Technology, 2. Yokohama National University, 3. Terumo Corporation, 4. Panasonic Connect Co., Ltd., 5. Dassault Systemes K.K., 6. ZUKEN Modelinx Inc., 7. Cybernet Systems Co., Ltd., 8. University of Yamanashi, 9. Ibaraki University, 10. Shibaura Institute of Technology)

2:20 PM - 2:40 PM

[350301-05-05]

NUMERICAL SIMULATION OF NOISE-INDUCED CHANGES TO NEURAL ACTIVITY

*Pedro Lima¹, Tiago Sequeira² (1. CEMAT /Instituto Superior Tecnico /University of Lisbon, 2. CEMAT/Instituto Superior Tecnico /University of Lisbon)**[350401-05] MS-20-3****Simulation-based Disaster Prediction and Mitigation****1:00 PM - 3:00 PM****Room 504****Chairman:****TBA**

1:00 PM - 1:20 PM

[350401-05-01]

Phase-field modeling of fault rupture and growth

*Jinhyun Choo¹, Fan Fei², Md Shumon Mia³, Ahmed E Elbanna³

(1. KAIST, 2. Lawrence Livermore National Laboratory, 3. University of Illinois at Urbana-Champaign)

1:20 PM - 1:40 PM

[350401-05-02]

A Robust Material Point Method for Modeling Metallic Materials with Extreme Deformation

*Sung-Han Yu¹, Tsung-Hui Huang¹, Harshal Tangade¹ (1. National Tsing Hua University)

1:40 PM - 2:00 PM

[350401-05-03]

POTeka ground surface observation technology and prediction methodology

*Hisato Iwashita¹, Fumiaki Kobayashi², Kazuomi Morotomi³, Shigeharu Shimamura³, Atsushi Higuchi⁴, Hiroyo Ohya⁴, Toshiaki Takano⁴, Tamio Takamura⁴ (1. Meisei Electric Co., Ltd, 2. National Defense Academy, 3. Japan Radio Co., Ltd, 4. Chiba University)

2:00 PM - 2:20 PM

[350401-05-04]

Impact of Underwater Pile Arrays on Turbulent Transport Processes and Dynamics of Gravity Currents

*Ching-Sen Wu¹, Jyun-Ting Ye¹ (1. National Ilan University, Civil Engineering)

2:20 PM - 2:40 PM

[350401-05-05]

An agent-based parametric analysis of miners' evacuation time from an underground fire for improved emergency planning

*Guang Xu¹ (1. Missouri University of Science and Technology)**[340201-06] MS-22-3****Innovative CAE for Vehicle Development and Cross-Industry Applications toward Safety and Sustainability****1:00 PM - 3:00 PM****Room 402****Chairman:****Makoto Tsubokura (RIKEN/Kobe University)**

1:00 PM - 1:20 PM

[340201-06-01]

Hyperthermal erosion of multifunctional nanocomposites TPS through reactive molecular dynamics simulations

*Seunghwa Yang¹, Inseok Jeon¹ (1. Chung-Ang University)

1:20 PM - 1:40 PM

[340201-06-02]

Automotive electrodeposition coating simulation using edge-based smoothed finite element method

*Yuki Onishi¹ (1. Institute of Science Tokyo)

1:40 PM - 2:00 PM

[340201-06-03]

2-WAY coupled simulation of vehicle motion and aerodynamics to investigate the mechanism of unsteady flows acting on an overtaken vehicle

*Tokimasa Shimada¹, Shion Sugao¹, Kento Narita¹, Rahul Bale^{1,2}, Kunihiro Yoshitake³, Fortunato Nucera³, Takashi Yoshino³, Makoto Tsubokura^{1,2} (1. Kobe University, 2. RIKEN Center for Computational Science, 3. Honda R&D Co., Ltd.)

2:20 PM - 2:40 PM

[340201-06-04]

Mechanism of Road Vehicle Wind Noise Modulated by Atmospheric Fluctuations and Reduction Measures

*Atsushi Tajima¹, Takumi Hirata², Jun Ikeda², Kosuke Nakasato², Takahiro Kamiwaki², Junichi Wakamatsu², Makoto Tsubokura³ (1. Graduate School of System Informatics, Kobe University, 2. Nissan Motor Co., Ltd., 3. Complex Phenomena Unified Simulation Research Team, RIKEN Center for Computational Science)

2:40 PM - 3:00 PM

[340201-06-05]

Analysis and Research on Split Front Wing and Vortex Generator of FSAE Racing Car

*Chenguang Lai¹, Zirui Hu¹, Junxiong Zeng¹ (1. Chongqing University of Technology)

[340701-05] MS-25-1

Creating a rational disaster response society through an automatic system for creating disaster prevention digital twins and numerous hazard simulations

1:00 PM - 3:00 PM

Room 407

Chairman:

Tomohide Takeyama (Kobe University)

1:00 PM - 1:20 PM

[340701-05-01]

Multi-Point Constraint System for High-Fidelity Finite Element Model Consisting of Structure Component Assembly

*Wataru Hotta¹, Naoto Mitsume², Naoki Morita², Munee Hori³ (1. Taisei Corporation, 2. University of Tsukuba, 3. JAMSTEC)

1:20 PM - 1:40 PM

[340701-05-02]

A Python-Based Framework for Automated Mesh Generation from IFC Data

*Stanislav Zairej¹, Satoshi Komatsu², Taiju Yoneda³ (1. Institute for Multidisciplinary Sciences, Yokohama National University, 2. Institute of Urban Innovation, Yokohama National University, 3. ICI General Center, Maeda Corporation)

1:40 PM - 2:00 PM

[340701-05-03]

A Prototype System for Automatic Generation of Road Bridge Models using Limited Data and Automated Seismic Response Simulation

*Kahori Iiyama¹, Hideyuki O-tani², Hiroshi Tamura³, Natsu Miura¹, Shuhei Takaya¹ (1. KAJIMA Technical Research Institute, 2. Japan Agency for Marine-Earth Science and Technology, 3. Yokohama National University)

2:00 PM - 2:20 PM

[340701-05-04]

Development of an algorithm for the automated generation of bridge models for disaster prevention urban digital twins

*Aleena Saleem¹, Yoshifumi Ito¹, Aqsa Jamil¹, Kahori Iiyama², Hiroshi Tamura¹ (1. Yokohama National University, Japan, 2. Kajima Technical Research Institute, Japan)

2:20 PM - 2:40 PM

[340701-05-05]

Validation of girder bridge models for earthquake response in disaster-prevention urban digital twins

Naota Tadokoro¹, Aleena Saleem¹, *Aleena Saleem¹, Hiroshi Tamura¹, Kahori Iiyama² (1. Yokohama National University, 2. Kajima Technical Research Institute)

[340706-08] MS-25-2

Creating a rational disaster response society through an automatic system for creating disaster prevention digital twins and numerous hazard simulations

3:30 PM - 5:30 PM

Room 407

Chairman:

Satoru Oishi (Kobe University)

3:30 PM - 3:50 PM

[340706-08-01]

Automated River Elevation Data Construction Using River Cross-sectional Survey Data for Flood Inundation Simulation

*Masanobu Takahashi¹, Kazuki Yamanoi², Katsushi Aso³, Takanari Hori³, Takumi Igarashi³, Nobuyuki Iwamae¹, Satoru Oishi⁴ (1. KAJIMA Technical Research Institute, 2. Disaster Prevention Research Institute, Kyoto University, 3. NiX JAPAN Co., Ltd., 4. Kobe University)

3:50 PM - 4:10 PM

[340706-08-02]

Development of Probabilistic Hazard Map Incorporating River Embankment Breach Probability

*Takumi Igarashi¹, Katsushi Aso¹, Kazuki Yamanoi², Satoru Oishi³ (1. NiX JAPAN Co., Ltd., 2. Disaster Prevention Research Institute, Kyoto University, 3. Research Center for Urban Safety and Security Department of Civil Engineering, Graduate School of Engineering KOBE)

4:10 PM - 4:30 PM

[340706-08-03]

Investigation on Rapid Assimilation Methods of Satellite Images into Digital Twins After Earthquake Disasters

*MASATO ISHII¹, Katsuji Aso¹, Satoru Oishi², Kazuki Yamanoi³ (1. NiX JAPAN Co. Ltd., 2. Research Center for Urban Safety and Security Department of Civil Engineering, Graduate School of Engineering KOBE, 3. Disaster Prevention Research Institute, Kyoto University)

Fri. Jul 4, 2025**Plenary Lecture****9:00 AM - 10:00 AM****Room 301**

[430101-01]

Physics-informed Machine Learning: a powerful computer modelling framework for engineering and science

Prof. Yuan Tong Gu (Queensland University of Technology)

Chairman:

Hiroshi Okada (Tokyo University of Science)

Semi-Plenary Lecture**10:20 AM - 11:00 AM****Room 501**

[450101-01]

Revealing respiratory physiology defence of inhaled airborne particles through multiphase flow simulations

Prof. Kiao Inthavong (RMIT University)

Chairman:

Kazuhide Ito (Kyushu University)

10:20 AM - 11:00 AM**Room 502**

[450201-01]

Generative-AI Design and Intelligent Optimization of Building Structures

Prof. Xin zheng Lu (Tsinghua University)

Chairman:

Junji Kato (Nagoya University)

11:00 AM - 11:40 AM**Room 501**

[450102-02]

Autonomous finite element analysis of fracture prediction in human bones applied in clinical practice

Prof. Zohar Yosibash (Tel Aviv University)

Chairman:

Kazuhide Ito (Kyushu University)

11:00 AM - 11:40 AM**Room 502**

[450202-02]

Intelligent design of topology optimization considering physics-related information

Prof. Jun Yan (Dalian University of Technology)

Chairman:

Junji Kato (Nagoya University)

Oral Presentation**[450401-06] MS-02-2****Computational Methods for Water Environmental Problems and Coastal/Flood Disaster Mitigation****1:00 PM - 3:00 PM****Room 504****Chairman:****Ethan Kubatko (Ohio State University)**

1:00 PM - 1:20 PM

[450401-06-01]

AI-driven coastal change detection on large radar datasets using HPC

*Alexander Ruetters¹, Wadim Koslow¹, Kathrin Rack¹, FabianHoppe¹, Luca Dell'Amore², Paola Rizzoli² (1. German Aerospace Center (DLR), Institute of Software Technology, 2. German Aerospace Center (DLR), Microwaves and Radar Institute)

1:20 PM - 1:40 PM

[450401-06-02]

Assessing The Impact of The CYGNSS Mission's Level-3 Merged Storm Wind Fields On ADCIRC Surge Simulations

*Mohammad Al-Khaldi¹, Joel T Johnson¹, Ethan Kubatko¹, Aaron Sines¹, Suranjan Nepal¹ (1. The Ohio State University)

1:40 PM - 2:00 PM

[450401-06-03]

Seasonally Adaptive Data Compression in LoRaWAN Using Huffman Coding

*Airi Kokuryo¹, Kohei Inoda¹, Akihito Kohiga¹, Takahiro Koita¹ (1. Doshisha University)

2:00 PM - 2:20 PM

[450401-06-04]

Study of sensor network construction using LoRaWAN for natural disaster prediction

*Kohei Inoda¹, Airi Kokuryo¹, Akihito Kohiga¹, Takahiro Koita¹ (1. Doshisha University)

2:20 PM - 2:40 PM

[450401-06-05]

Development of a real-time flood prediction model using dimensionality compression

*Ryuya Nakayama¹, Kanta Yamaguchi¹, Yuto Habutsu¹, Masayuki Hitokoto², Kazuo Kashiama¹ (1. Chuo University, 2. Nippon Koei Co., Ltd.)

2:40 PM - 3:00 PM

[450401-06-06]

Gas-liquid-solid three-phase flow analysis with multiple objects using stabilized MINI element

*Junichi Matsumoto¹, Tomohiro Sawada¹ (1. National Institute of Advanced Industrial Science and Technology (AIST))**[450407-10] MS-02-3****Computational Methods for Water Environmental Problems and Coastal/Flood Disaster Mitigation****3:30 PM - 5:30 PM****Room 504****Chairman:****Junichi Matsumoto (AIST)**

3:30 PM - 3:50 PM

[450407-10-01]

Parameter Aware Koopman Operators For Surrogate Modeling

*Nishant Panda¹, Himanshu Singh¹, Sourav Dutta² (1. Los Alamos National Lab, 2. University of Texas at Austin)

3:50 PM - 4:10 PM

[450407-10-02]

Research on visualization for disaster prevention education using XR technology

*Kazuya Nojima¹, Yuji Kozono², Takuma Kontani¹, Shingo Zenkoji², Masaaki Sakuraba³ (1. Digital Design Center, Research and Development Center, Nippon Koei Co., Ltd., 2. Center for Technology Development, Research and Development Center, Nippon Koei Co., Ltd., 3. Research and Development Center, Nippon Koei Co., Ltd.)

4:10 PM - 4:30 PM

[450407-10-03]

Deep Learning for Underwater Object Classification Using Synthetic Datasets from CAD and Physically-Based Rendering

*Hiroshi Okawa¹, Shota Yagi¹, Seiji Itano¹, Kazuo Kashiya² (1. Eight-Japan Engineering Consultants Inc., 2. Chuo University)

4:30 PM - 4:50 PM

[450407-10-04]

Development of a land use classification model based on deep learning using aerial photographs and its application to flood inundation

*Yusuke Odate¹, Yuto Habutsu¹, Masayuki Hitokoto², Kazuo Kashiya¹ (1. Chuo University, 2. Nippon Koei Co., Ltd.)

[440601-05] MS-03-2

Advances in Hypercomplex disaster simulation and modeling

1:00 PM - 3:00 PM

Room 406

Chairman:

Takatoshi Kiriya (Shimizu Corporation)

1:00 PM - 1:20 PM

[440601-05-01]

Nonlinear interaction between thermodynamic and hydrodynamic instability with partially miscible fluids in porous medium

*Ching-Yao Chen¹, Priya Verma¹ (1. National Yang Ming Chiao Tung University)

1:20 PM - 1:40 PM

[440601-05-02]

Spatial Distribution Estimation of Geotechnical Properties and Slope Stability Evaluation Using the Hachinohe City Geotechnical Database

*Kenta Tozato¹, Shota Yamauchi¹, Haruka Furusato¹, Shinsuke Takase¹, Kenji Kaneko¹ (1. Hachinohe Institute of Technology)

1:40 PM - 2:00 PM

[440601-05-03]

Fluid-Structure Interaction analysis using Finite Cover Method
Haruka Furusato¹, *Shinsuke Takase¹, Seizo Tanaka², Tozato Kenta¹, Kenji Kaneko¹ (1. Hachinohe Institute of Technology, 2. Hiroshima Institute of Technology)

2:00 PM - 2:20 PM

[440601-05-04]

Development of a fluid-structure interaction model based on the finite cover method and the finite element method

*Guoming Ling¹, Mitsuteru Asai¹, Kenjiro Terada² (1. Kyushu University, 2. Tohoku University)

2:20 PM - 2:40 PM

[440601-05-05]

Mass-Preserving Particle Level Set Method with Kernel Function Correction for the simulation of multiphase flow

*Shunsuke KURIOKA¹, Changhong HU¹ (1. Kyushu University)

[440201-05] MS-04-1

**Numerical Simulation in Geomechanics and Geodisasters
Co-organized by TC103 of International Society for Soil
Mechanics and Geotechnical Engineering**

1:00 PM - 3:00 PM

Room 402

Chairman:

Kazunori Fujisawa (Kyoto University)

1:00 PM - 1:20 PM

[440201-05-01]

Numerical reproduction of wave-induced seabed liquefaction and solidification

*Takumi Iijima¹, Tomohiro Toyoda¹, Noda Toshihiro¹ (1. Nagoya University)

1:20 PM - 1:40 PM

[440201-05-02]

Identification of hydro-mechanical parameters in rainfall-induced seepage and deformation of unsaturated slopes using a particle filter

Shin Niira¹, Sanchitha H.S. Jayakody², Kyohei Ueda¹, *Ryosuke Uzuoka¹ (1. Kyoto University, 2. National Building Research Organisation)

1:40 PM - 2:00 PM

[440201-05-03]

Numerical simulation of landslide-induced consequences on underwater infrastructure

*Pavel A. Trapper¹ (1. Ben-Gurion University of the Negev)

2:00 PM - 2:20 PM

[440201-05-04]

Application of velocity-based Space-Time Finite Element Method for wave propagation problems in elasto-plastic media

*Shion Shimizu¹, Vikas Sharma¹, Kazuma Takenaka¹, Kazunori Fujisawa¹ (1. Graduate School of Agriculture, Kyoto-University)

2:20 PM - 2:40 PM

[440201-05-05]

Arbitrary higher order space-time finite element methods for wave propagation problems

*Vikas Sharma¹, Kazunori Fujisawa¹, Ryoya Matsumoto¹, Shion Shimizu¹ (1. Graduate School of Agriculture, Kyoto University)

[440206-09] MS-04-2

**Numerical Simulation in Geomechanics and Geodisasters
Co-organized by TC103 of International Society for Soil
Mechanics and Geotechnical Engineering**

3:30 PM - 5:30 PM

Room 402

Chairman:

Vikas Sharma (Kyoto University)

3:30 PM - 3:50 PM

[440206-09-01]

Large-area Slope Stability Analysis using Three-dimensional Limit Equilibrium Method with Ellipsoidal Slip Surfaces and Particle Swarm Optimization

*Daichi Sugo¹, John Yeonjun Choe², Kenta Tozato³, Reika Nomura¹, Kenjiro Terada¹, Kosuke Watanabe⁴, Shuji Moriguchi¹ (1. Tohoku University, 2. University of Washington, 3. Hachinohe Institute of Technology, 4. Chubu Electric Power)

3:50 PM - 4:10 PM

[440206-09-02]

Comparison of failure modes in steep slopes using centrifugal models and 3D DEM simulations

*Thirapong Pipatpongsa¹, Shanzhi Tao², Yosuke Higo² (1. National Yang Ming Chiao Tung University, 2. Kyoto University)

4:10 PM - 4:30 PM

[440206-09-03]

Effect on particle resolution to a seismic response 3D peridynamics analysis with friction

*Taiki Shimbo¹, Chia Kanada¹, Tomoki Kawamura², Yutaka Fukumoto³ (1. National Institute of Technology, Ishikawa College, 2. Godai Kaihatsu Corporation, 3. Okayama University)

4:30 PM - 4:50 PM

[440206-09-04]

Validation experiment for resolved DEM-CFD solid-fluid coupling method considering object shapes

*Yutaka Fukumoto¹, Takatoshi Kiriya², Kumpei Tuji³, Koichi Hosaka⁴, Daisuke Nishiura⁵, Mitsuteru Asai⁶ (1. Okayama University, 2. Institute of Technology, Shimizu Corporation, 3. Tohoku University, 4. Yachiyo Engineering Co., Ltd., 5. Japan Agency for Marine-Earth Science and Technology, 6. Kyushu University)

[450103-04] MS-05-5

Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics

1:00 PM - 3:00 PM

Room 501

Chairman:

Koji Nishiguchi (Nagoya University / RIKEN)

1:00 PM - 1:20 PM

[450103-04-01]

Multiscale analysis of sound absorption and mechanical properties of porous materials based on homogenization method

*Kenshin Miyama¹, Tetsuya Matsuda¹, Gai Kubo², Kenichiro Nagai² (1. University of Tsukuba, 2. Japan Aerospace Exploration Agency)

1:20 PM - 1:40 PM

[450103-04-02]

An iterative SPH-FEM coupling method based on fictitious domain approach

*Hiroyuki Omura¹, Kumpei Tsuji², Takuzo Yamashita¹, Naoto Mitsume³, Mitsuteru Asai⁴ (1. National Research Institute for Earth Science and Disaster Resilience, 2. Tohoku University, 3. University of Tsukuba, 4. Kyushu University)

[450203-07] MS-07-5

Multiscale modeling and multiscale analysis for computational materials and engineering applications

1:00 PM - 3:00 PM

Room 502

Chairman:

Li-Wei Liu (National Taiwan University)

1:00 PM - 1:40 PM

[450203-07-01]

Hybrid Classical-Quantum Machine Learning Models Predicting the Energetics of Complex Materials

Hsu-Kai Cheng¹, Po-Yu Yang¹, *Chun-Wei Pao¹ (1. Academia Sinica)

1:40 PM - 2:00 PM

[450203-07-02]

Investigating the Impact of Chemical Short-Range Order on the Mechanical Properties of High-Entropy Intermetallic Alloys Using Machine Learning Potential Model

*Po-Yu Yang¹, Meng-Jung Hsieh², Yu-Hsiang Wang¹, Chun-Wei Pao¹ (1. Research Center for Applied Sciences, Academia Sinica, 2. Institute of Applied Mechanics, National Taiwan University)

2:00 PM - 2:20 PM

[450203-07-03]

Enhancing the Hydrogen Evolution Reaction Activity of the Lithium-intercalated MoS₂: A First-principles Study

*Jui-Cheng Kao^{1,2}, Yu-Chieh Lo¹, Chun-Wei Pao² (1. Department of Materials Science and Engineering, National Yang Ming Chiao Tung University, 2. Research Center for Applied Sciences, Academia Sinica)

2:20 PM - 2:40 PM

[450203-07-04]

Impact-Induced Erosion in Steam Turbine Blades Using Finite Element Analysis

*Wan Fathul Hakim W Zamri¹, Nazar Julasrin², Muhamad Faiz Md Din³ (1. Universiti Kebangsaan Malaysia, 2. Taisek Lamick Asia (Malaysia) Sdn. Bhd, 3. The National Defence University of Malaysia)

2:40 PM - 3:00 PM

[450203-07-05]

Auxetic Metamaterials for Regional Seismic Protection Strategy

*Ahmed Abdalfatah Saddek¹, Tzu-Kang Lin², Wen-Kuei Chang³ (1. Postdoctoral Research Fellow, 2. Professor, 3. Master student)

[440101-05] MS-08-5

Recent advances in impact and blast analyses

1:00 PM - 3:00 PM

Room 401

Chairman:

Weifang Xiao (Tongji University)

Toshiyuki Horiguchi (National Defense Academy)

1:00 PM - 1:20 PM

[440101-05-01]

Improved constitutive model for steel fibre reinforced concrete Tung T Tran², *Thong Pham¹, Hong Hao^{3,4} (1. University of South Australia, 2. Aup Perth, 3. Curtin University, 4. Guangzhou University)

1:20 PM - 1:40 PM

[440101-05-02]

Investigation of the Fracture Mechanisms of the Human Acetabulum Under Dynamic Impact Loading

*Ching Chi Hsu¹, Kao Shang Shih², Shang Jia Huang¹ (1. National Taiwan University of Science and Technology, 2. Shin Kong Wu Ho-Su Memorial Hospital)

1:40 PM - 2:00 PM

[440101-05-03]

Analytical study on damage behavior of reinforced concrete slabs subjected to impact of falling objects considering slab geometry

*Masato Mizuta¹, Yasunori Mizushima¹, Yuki Ikeda¹, Ryoko Shimada² (1. Kobe university, 2. Building Structure Engineering Department, JFE Metal Products Corporation)

2:00 PM - 2:20 PM

[440101-05-04]

Estimation of internal blast loads within single rectangular rooms using RMOI

*Weifang Xiao¹, Mingtao Wu¹, Hui Li¹ (1. Tongji University)

2:20 PM - 2:40 PM

[440101-05-05]

Study on response of a reinforced concrete structure with internal equipment subjected to projectile impact

*Zuoyi Kang¹, Yukihiko Okuda¹, Akemi Nishida¹, Haruji Tsubota¹, Masaharu Itoh¹ (1. Japan Atomic Energy Agency)

[440301-05] MS-12-1

Simulation of Earthquake Hazards and Disasters with HPC

1:00 PM - 3:00 PM

Room 403

Chairman:

Takane Hori (Japan Agency for Marine-Earth Science and Technology)

1:00 PM - 1:40 PM

[440301-05-01]

Massively parallel algorithms for efficient Bayesian inference of earthquake fault parameters

*Kai Nakao¹, Tsuyoshi Ichimura¹, Kohei Fujita¹, Takane Hori², Tomokazu Kobayashi³, Hiroshi Munekane³ (1. The University of Tokyo, 2. Japan Agency for Marine-Earth Science and Technology, 3. Geospatial Information Authority of Japan)

1:40 PM - 2:00 PM

[440301-05-02]

Accelerating implicit unstructured finite-element simulation by converting random access-based computation to sequential access-based computation

*Kohei Fujita¹, Tsuyoshi Ichimura¹, Muneo Hori², Lalith Maddegadara¹ (1. The University of Tokyo, 2. Japan Agency for Marine-Earth Science and Technology)

2:00 PM - 2:20 PM

[440301-05-03]

Large-scale simulation of fault rupture subjected to far-field loading and an MPI+MPI hybrid parallel computational model

*Elia Nicolin¹, Lalith Maddegadara², Lionel Quaranta³, Kohei Fujita², Tsuyoshi Ichimura², Muneo Hori⁴ (1. Department of Civil Engineering, The University of Tokyo, 2. Earthquake Research Institute, The University of Tokyo, 3. GE Vernova, Taichung City, Taiwan, 4. Japan Agency for Marine-Earth Science and Technology)

2:20 PM - 2:40 PM

[440301-05-04]

Seismic analysis of transmission tower-line system considering soil-structure interaction

*Eiji Tanaka¹, Kosei Yachi¹, Yasuhiro Ohashi¹ (1. Shimizu Corporation)

2:40 PM - 3:00 PM

[440301-05-05]

Application of HPC-FEM to large-scale 3D seismic response analysis in the area around nuclear power plants using the supercomputer "Fugaku"

*Yuichi Otsuka¹, Ayako Maene², Kohei Fujita³, Tsuyoshi Ichimura³ (1. Tokyo Electric Power Services Co., Ltd, 2. Tokyo Electric Power Company Holdings, Incorporated, 3. Earthquake Research Institute, The University of Tokyo)

[440306-11] MS-12-2

Simulation of Earthquake Hazards and Disasters with HPC

3:30 PM - 5:30 PM

Room 403

Chairman:

Kohei Fujita (The University of Tokyo)

3:30 PM - 3:50 PM

[440306-11-01]

Road to "AI for Science": Exploring Software Sustainability through "Couplers"

*Kengo Nakajima¹ (1. The University of Tokyo/RIKEN R-CCS)

3:50 PM - 4:10 PM

[440306-11-02]

Prototype System for Forecasting of Plate Boundary Sliding Behavior Based on Sequential Data Assimilation in the Nankai Trough

*Takane Hori¹, Ryoko Nakata^{1,2}, Takeshi Iinuma¹, Yoshihisa Hiyoshi¹, Mamoru Hyodo³, Daisuke Sato¹ (1. Japan Agency for Marine-Earth Science and Technology, 2. The University of Tokyo, 3. Kochi Local Meteorological Office)

4:10 PM - 4:30 PM

[440306-11-03]

Dispersive tsunami simulations using JAGURS

*Toshitaka Baba¹ (1. Tokushima University)

4:30 PM - 4:50 PM

[440306-11-04]

Long period ground motion propagation in the Kanto Plain caused by an earthquake on the Japan Sea side

*Yu Yamamoto¹, Masashi Nishimoto¹, Yuji Yagi², Yoshihisa Hiyoshi³, Takane Hori³ (1. Taisei Corporation, 2. University of Tsukuba, 3. Japan Agency for Marine-Earth)

4:50 PM - 5:10 PM

[440306-11-05]

Three-dimensional Ground Motion Simulations for Evaluation of Site Amplification

*On-Lei Annie Kwok¹, Hsin-Chen Chou¹, Pai-Chen Guan² (1. National Taiwan University, 2. National Taiwan Ocean University)

5:10 PM - 5:30 PM

[440306-11-06]

GMSS3.0: An Efficient Computational Tool for Broadband Ground Motion Simulation

*Yuxiang Tang¹, Hiroe Miyake², P. Martin Mai³ (1. The University of Melbourne, 2. University of Tokyo, 3. King Abdullah University of Science and Technology)

[440401-02] MS-13-2

Particle-Based Numerical Methods for Simulating Solid-Granular Interactions

1:00 PM - 3:00 PM

Room 404

Chairman:

TBA

1:00 PM - 1:20 PM

[440401-02-01]

Extended B-spline-based mixed implicit material point method stabilized by variational multiscale method

*Riichi Sugai¹, Reika Nomura¹, Shuji Moriguchi¹, Kenjiro Terada¹

(1. Tohoku University)

1:20 PM - 1:40 PM

[440401-02-02]

A Stress-controlled Void Nucleation GTN Model for Ductile Fracture Simulation Using Smoothed Particle Hydrodynamics

*Xuelong LYU¹, Sewon Jeon¹, Hidefumi Yukawa¹, Hitoshi Nakamura¹, Kazumi Matsui¹, Takahiro Yamada¹ (1. Yokohama National University)

[450301-05] MS-14-2

Meshless and Particle method for safety problems

1:00 PM - 3:00 PM

Room 503

Chairman:

Abbas Khayyer (Kyoto University)

1:00 PM - 1:40 PM

[450301-05-01]

Refined resolved-unresolved SPH-DEM coupling framework based on SPH(2)

*Kumpei Tsuji¹, Hiroyuki Omura², Shujiro Fujioka³, Mitsuteru Asai³ (1. Tohoku University, 2. National Institute for Earth Science and Disaster Resilience, 3. Kyushu University)

1:40 PM - 2:00 PM

[450301-05-02]

An SPH and RBD Coupling Approach for Multiphase Water Entry Simulations

*Chaoyang Guo¹, Moubin Liu¹ (1. Peking University)

2:00 PM - 2:20 PM

[450301-05-03]

Resolved Coupling of Stony Debris Flows With a Two-Point Multi-Phase Method

*Yangfan Ma¹, Mitsuteru Asai¹ (1. Kyushu University)

2:20 PM - 2:40 PM

[450301-05-04]

Semi-resolved CFD-DEM modeling of particle-pore clogging in pervious asphalt concrete: Implications for road safety

*Jiayi Chi¹, Moubin Liu¹ (1. Peking University)

2:40 PM - 3:00 PM

[450301-05-05]

A Semi-resolved SPH-DEM method for the submerged granular collapse simulation

*Sijie Wang¹, Moubin Liu¹ (1. Peking University)

[450306-11] MS-14-3

Meshless and Particle method for safety problems

3:30 PM - 5:30 PM

Room 503

Chairman:

Mitsuteru Asai (Kyushu University)

3:30 PM - 3:50 PM

[450306-11-01]

Stabilization of peridynamic differential operators through diagonal scaling preconditioning

*Sunwoo Kim¹, Suyeong Jin¹, Jung-Wuk Hong¹ (1. KAIST)

3:50 PM - 4:10 PM

[450306-11-02]

Numerical simulation of bubble rising behaviors based on MPS-MALF and LSMPs methods

*Juanli Zuo¹, Seiichi KOSHIZUKA¹ (1. The University of Tokyo)

4:10 PM - 4:30 PM

[450306-11-03]

Development of snowplow simulator coupled with vehicle dynamics analysis

*Kohei Murotani¹, Yuki Akiyama¹, Risa Saito¹, Hidenori Ishii¹, Hiroki Tsuji¹, Yasushi Kamata¹, Masakazu Takagaki¹ (1. Railway Technical Research Institute)

4:30 PM - 4:50 PM

[450306-11-04]

Advanced SPH simulation for anisotropic seepage flow with an unresolved coupling approach

*Yoshitaka Inoue¹, Kazuma Takahashi¹, Kumpei Tsuji¹, Mitsuteru Asai² (1. Tohoku University, 2. Kyushu University)

4:50 PM - 5:10 PM

[450306-11-05]

Velocity and pressure monolithic scheme based on SPH for fluid flow simulations with arbitrary solid wall boundaries

*Shodai Okano^{1,2}, Daniel Morikawa³, Louis Ge², Mitsuteru Asai¹ (1. Kyushu University, 2. National Taiwan University, 3. Tongji University)

5:10 PM - 5:30 PM

[450306-11-06]

A Massive Parallel SPH Framework with Adaptive Resolution and Load Balancing for Largescale Simulations

*Lingxiao Ma¹, Xiufeng Yang², Moubin Liu¹ (1. Peking university, 2. Beijing Institute of Technology)

[440501-03] MS-15-2

Direct Computation of Safety Margins for Structures and Materials

1:00 PM - 3:00 PM

Room 405

Chairman:

Geng Chen (Beijing Jiatong University)

1:00 PM - 1:20 PM

[440501-03-01]

A topology optimization algorithm for elastoplastic structures based on their safety margins against cyclic loading

Changxiong Huang¹, Geng Chen¹, Lele Zhang², *Konstantinos V. Spiliopoulos³ (1. School of Mechanical, Electronic and Control Engineering, Beijing Jiaotong University, Beijing 100044, CHINA, 2. National International Science and Technology Cooperation Base, Beijing Jiaotong University, Beijing 100044, CHINA, 3. Institute for Structural Analysis & Antiseismic Research, Department of Civil Engineering, National Technical University of Athens, Athens 15780, GREECE)

1:20 PM - 1:40 PM

[440501-03-02]

Multiscale design and loading capacity evaluation of additive manufactured lattices

*Min chen Chen¹, Zhouyi Xiang¹, Shunqi Zhang² (1. Xi'an Jiaotong-Liverpool University, 2. Shanghai University)

1:40 PM - 2:00 PM

[440501-03-03]

Shakedown solutions of cavities in cohesive-frictional materials and their applications in underground compressed air energy storage

*Juan Wang¹, Pin-Qiang Mo², Xiaojun Tang^{1,3} (1. Department of

Civil Engineering, University of Nottingham Ningbo China, 2. State Key Laboratory of Intelligent Construction and Healthy Operation & Maintenance of Deep Underground Engineering, School of Mechanics and Civil Engineering, University of Mining and Technology, 3. Engineering and Technology Research Institute, Ningbo Jiangong Engineering Group Co., Ltd.)

[430102-07] MS-16-5

Advances in Numerical Methods for Enhancing Safety and Resilience of Structures in Civil and Architectural Engineering

1:00 PM - 3:00 PM

Room 301

Chairman:

Wei-Tze Chang (National Center for Research on Earthquake Engineering)

[430102-07-01]

Structural Damage Detection using Modal Information and Interpretable Variational Autoencoder

*Shieh-Kung Huang¹, You-Jing Li¹ (1. National Chung Hsing University)

1:20 PM - 1:40 PM

[430102-07-02]

Damage identification of braces in steel-framed school gymnasiums using echo state networks

*Jing yao Zhang¹, Taisei Toyama², Jun Fujiwara³ (1. Kyoto University, 2. West Japan Railway Company, 3. National Research Institute for Earth Science and Disaster Resilience)

1:40 PM - 2:00 PM

[430102-07-03]

Identification of instantaneous stiffness for mid- and low-rise buildings using optimization techniques

*Daichi Ukita¹, Jingyao Zhang¹, Jun Fujiwara² (1. Department of Architecture and Architectural Engineering, Kyoto University, 2. Hyogo Earthquake Engineering Research Center, NIED)

2:00 PM - 2:20 PM

[430102-07-04]

Estimation of Hysteretic Shapes for Reinforced Concrete Columns Using Conditional Generative Adversarial Network

Han-Xhing Chen¹, Ci-Xin Hsu¹, *Peng-Yu Chen¹ (1. National Central University)

2:20 PM - 2:40 PM

[430102-07-05]

Inverse identification of steel material properties using Bayesian approach

*Makoto Ohsaki¹, Do Kim Bach² (1. Kyoto University, 2. University of Houston)

2:40 PM - 3:00 PM JST

[430102-07-06]

A Smart Method of the Performance-Based Design and RSET Prediction for Complex Building Based on Deep Learning

*Tong Lu¹, Yuxin Zhang¹, Xinyan Huang¹ (1. The Hong Kong Polytechnic University)

[440403-06] MS-18-1

Damage Evaluation and Structural Application of Cementitious Materials

3:30 PM - 5:30 PM

Room 404

Chairman:

Rena Chengxiang Yu (University of Castilla-La Mancha)

3:30 PM - 3:50 PM

[440403-06-01]

Influence of confinement loss on bursting failure mechanism for various rocks under polyaxial loading conditions

*Selahattin Akdag¹, Murat Karakus², Giang D. Nguyen³ (1. WASM: Minerals, Energy and Chemical Engineering, Curtin University, 2. School of Chemical Engineering, Mining and Petroleum Engineering, The University of Adelaide, 3. School of Architecture and Civil Engineering, The University of Adelaide)

3:50 PM - 4:10 PM

[440403-06-02]

Strength and water resistance improvement of magnesium oxychloride cement: An overview

*Inzimam Ul Haq¹, Joon Ho Seo¹, H.K. Lee¹ (1. Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea)

4:10 PM - 4:30 PM

[440403-06-03]

3D Analysis Approach for the Analysis of Crack Growth in NC-VFC Interface

*elham abouelabass mahmoud¹, Tomohiro Miki² (1. phd student, 2. An associate professor)

4:30 PM - 4:50 PM

[440403-06-04]

A numerical model for the dynamic fracture propagation in fibre-reinforced concrete

*Rena Chengxiang Yu¹, Elisa Poveda¹, Gonzal Ruiz¹ (1. University of Castilla-La Mancha)

[440504-07] MS-21-1

Mathematical Modelling and Simulation for Social, Environmental, and Disaster Prevention Issues

3:30 PM - 5:30 PM

Room 405

Chairman:

Hideki Fujii (University of Tokyo)

3:30 PM - 3:50 PM

[440504-07-01]

Method for Accelerating Microscopic Crowd Simulation and Its GPU Implementation

*Naoto Fujikawa¹, Hideki Fujii¹ (1. Department of Systems Innovation, School of Engineering, The University of Tokyo)

3:50 PM - 4:10 PM

[440504-07-02]

Traffic Flow Simulation in Mixed Traffic Situation of Vehicle Platoon and General Vehicle

Daisuke Ishizawa¹, *Haifa Hasna Zahrah¹, Eisuke Kita¹ (1. Nagoya University)

4:10 PM - 4:30 PM

[440504-07-03]

Research on evacuation guidance considering the distribution of

residents in the building using multi-agent simulation

*Yuichiro Yamabe¹ (1. KOBE University)

4:30 PM - 4:50 PM

[440504-07-04]

Porous Media-Based Thermal Modeling for Urban Heat Island Mitigation: A Coupled Problem Approach with Optimal Control

*Mohammed Louaked¹ (1. University of Caen Normandie)

[450501-05] MS-23-1

Computational Fluid and Particle Dynamics of the Nose and Airway in association with SCONA

1:00 PM - 3:00 PM

Room 505

Chairman:

Kazuhide Ito (Kyushu University)

1:00 PM - 1:20 PM

[450501-05-01]

In silico modelling of inhalation exposure to droplets and droplet nuclei in indoor environments as influenced by human close contact behavior

*Ruth Nyabonyi Onkangi¹, Kazuki Kuga¹, Kazuhide Ito¹ (1. Kyushu University)

1:20 PM - 1:40 PM

[450501-05-02]

The effect of metabolic heat generation on dermal exposure heterogeneity

*Hyun-Gyu Park¹, Eisaku Sumiyoshi², Hiroshi Harashima², Kazuki Kuga¹, Kazuhide Ito¹ (1. Faculty of Engineering Sciences, Kyushu University, JAPAN, 2. Technology Research Institute, Obayashi Corporation, JAPAN)

1:40 PM - 2:00 PM

[450501-05-03]

Linked between-host and within-host modeling of viral exposure dynamics using highperformance computing

*Alicia Murga¹, Tokiya Tanaka¹, Rahul Bale^{1,2}, Kazuhide Ito³, Makoto Tsubokura^{1,2} (1. Kobe University, 2. Riken Center for Computational Sciences, 3. Kyushu University)

2:00 PM - 2:20 PM

[450501-05-04]

Numerical study on the transport characteristics of toxic chemical gases and aerosols in human respiratory system

*Jialin Wu¹, Meijie Liu¹, Feifan He², Jinghong Wang¹ (1. College of Safety Science and Engineering, Nanjing Tech University, Nanjing, CHINA., 2. School of Safety Science, Tsinghua University, Beijing, CHINA.)

2:20 PM - 2:40 PM

[450501-05-05]

Impact of Lateral Neck Angle on Droplet Transport

*Nonoka Ikenaga¹, Ayato Takii², Masashi Yamakawa¹, Minsuok Kim³ (1. Kyoto Institute of Technology, 2. Kobe University, 3. Loughborough University)

[450506-10] MS-23-2

Computational Fluid and Particle Dynamics of the Nose and Airway in association with SCONA

3:30 PM - 5:30 PM

Room 505

Chairman:

Kazuhide Ito (Kyushu University)

3:30 PM - 3:50 PM

[450506-10-01]

Computational Modeling and Deposition Analysis of Indoor Microplastics/Microfibers in the Realistic Human Respiratory System

*Yuan Ni¹, Khoa Nguyen Dang¹, Ito Kazuhide¹ (1. kyushu university)

3:50 PM - 4:10 PM

[450506-10-02]

Unveiling Microplastic Dynamics in Airways: A Hybrid Framework for Transport, Deposition and Toxicity Analysis

*Mohammad S. Islam¹, Md. Z. Islam², Md Mizanur Rahman³, YuanTong Gu⁴, Emilie Sauret⁴ (1. Senior Lecturer, School of Mechanical and Mechatronic Engineering, University of Technology Sydney, 2. High Performance Computing (HPC) Laboratory, Department of Mathematics, Jashore University of Science and Technology, Jashore-7408, Bangladesh, 3. mz.islam@just.edu.bd 3Department of Mathematics, Islamic University, Kushtia- 7003, Bangladesh , 4. School of Mechanical, Medical and Process Engineering, Queensland Uni. of Technology, Brisbane, QLD 4000, Australia.)

4:10 PM - 4:30 PM

[450506-10-03]

Indoor air quality assessment of near ideal displacement and mixing ventilation systems

*Rahul Bale^{1,2}, Haruhiro Yamamoto², Alicia Murga², Makoto Tsubokura^{1,2} (1. RIKEN Center for Computational Science, 2. Kobe University)

4:30 PM - 4:50 PM

[450506-10-04]

Minimizing droplet inhalation exposure in a sustainable indoor environment using HPC and optimization algorithms

*Haruki Nakagawa¹, Rahul Bale^{1,2}, Alicia Murga¹, Makoto Tsubokura^{1,2} (1. Kobe University, 2. RIKEN Center for Computational Sciences)

4:50 PM - 5:10 PM

[450506-10-05]

Numerical Investigation of Inhalation Exposure to Spherical and Nonspherical Particles Assuming Pollen in Semi-outdoor Environments

*Ruru Sakata¹, Islam M.S. Abouelhamd¹, Yuan Ni¹, Kazuki Kuga², Kazuhide Ito² (1. Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, 2. Faculty of Engineering Sciences, Kyushu University)

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Fluid and Granular Simulation Software Optimized for GPU Computing



Particleworks™
Particle-based simulation software for CAE

Particleworks is a Japan-born fluid simulation software used to simulate the behavior of fluids, such as water and oil flow. It's widely adopted across industries, including automobiles, machinery, materials, chemicals, electronics, food, consumer goods, medicine, civil engineering, disaster prevention, energy, and dual-use applications. GPU computing delivers supercomputer-level speed.

APPLICATIONS



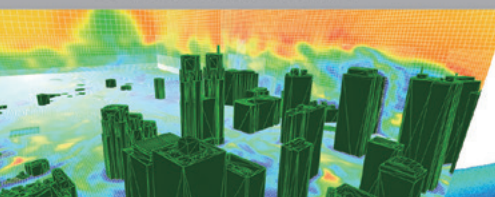
Oil pan sloshing simulation



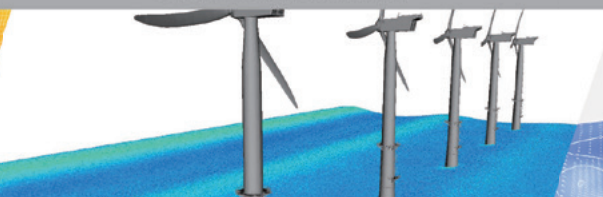
Snowplow train simulation



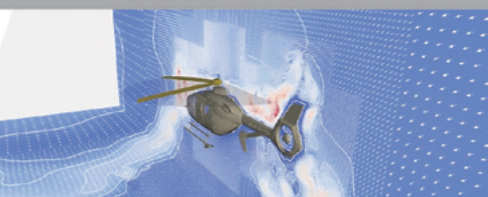
Oil behavior simulation



Wind simulation around high-rise buildings



Sea surface simulation



Airflow simulation around a helicopter



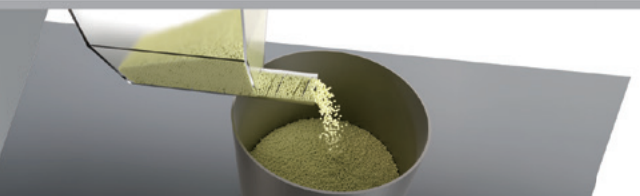
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Advanced Simulator for Granular Materials

Granuleworks is a powder/granular simulation software based on the Discrete Element Method (DEM). It enables easy simulation of granular behaviors such as mixing, conveying, and filling. Co-simulation with Particleworks can also simulate complex phenomena like concrete flow. GPU computing ensures high-speed performance.

APPLICATIONS



Ribbon mixer



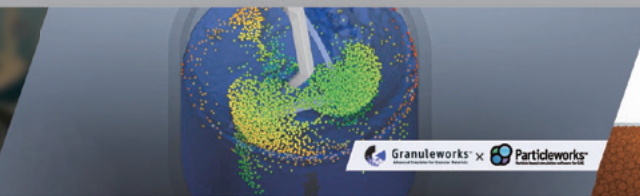
Screw feeder



Aggregate concrete flow simulation



Powder mixing simulation



Fluid-granular simulation



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Accelerating Technology Innovation With High-Precision Simulation

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CONTACT

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A Pre/Post Platform for Computational Fluid Dynamics (CFD) based on well-known Open-Source Codes (OpenFOAM).

Large-scale support, high customizability, high-speed automatic meshing, robust solvers for various CFD applications

Pre-Processing

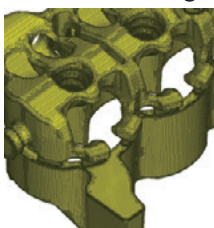
GEOMETRY PREPARATION AND MESHING

All-in-one CFD Pre-Processing



One software on Windows platform which includes all CFD Pre-Processing operations. (CAD edition>Mesh Generation >Solver Settings).

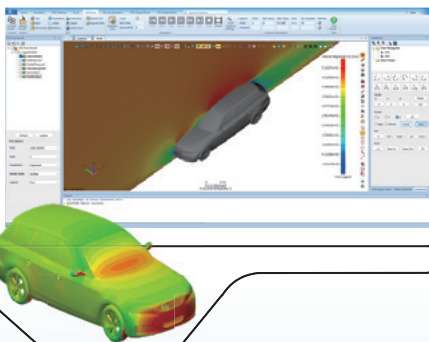
Automatic Meshing



Generates predominantly hexahedral meshes with polyhedral cells near the surfaces of the geometry.

CAD CLEANUP

Handles complex geometries become MORE EASILY

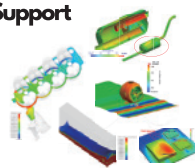


Solvers

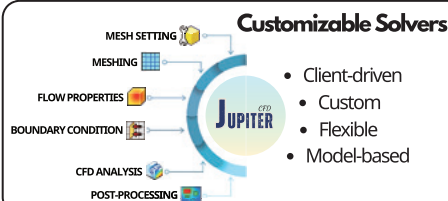
CFD ANALYSIS APPLICATION

Wide CFD Application Support

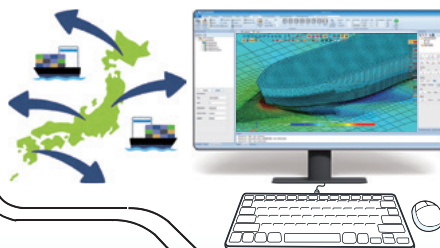
- Compressible
- Incompressible
- Multiphase flows with turbulence and heat transfer models.



UPGRADE



- ✓ Compatible with external CFD-Solvers
- ✓ Allows Windows clients to run solvers directly on Linux HPC servers

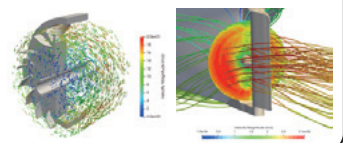


Post-Processing

MULTI-FORMAT RESULTS

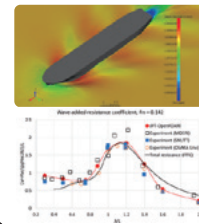
Supports various result formats

- CGNS
- EnSight
- VTK
- PVD, etc.

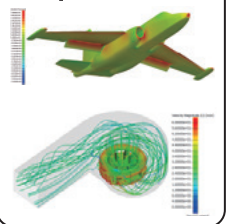


FAST CFD POST - PROCESSING

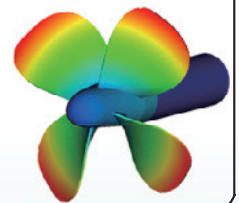
High - performance Post - Processing for CFD simulations



Fast visualization for complex flow interpretation

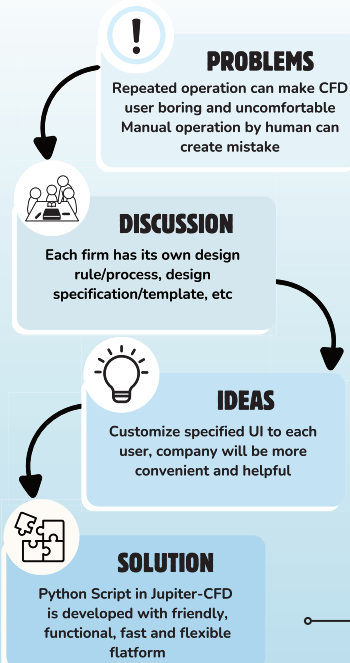


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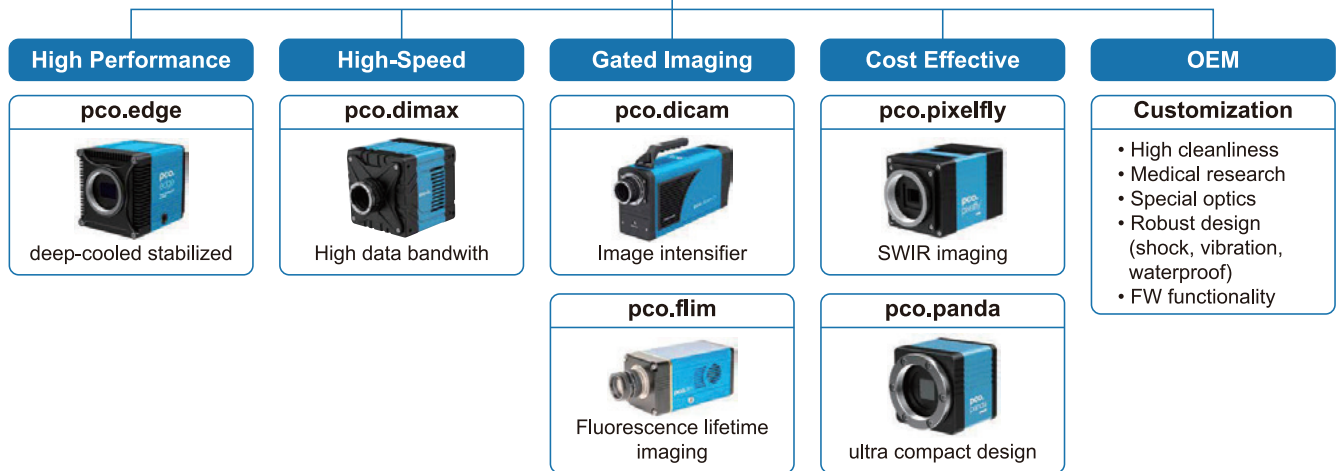


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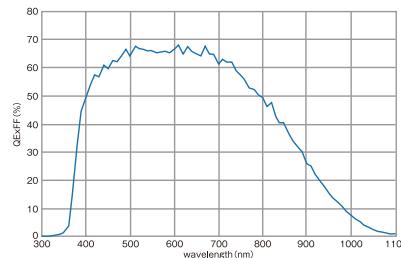
pco. camera systems



pco.dimax 3.6 ST high speed streaming camera

Key features

- custom global shutter image sensor
- Pixel size $11\ \mu\text{m} \times 11\ \mu\text{m}$
- up to 2100 fps @ 3.6MP
- temperature stabilized sensor
- high-speed streaming platform
- no memory, low latency image transfer
→ “unlimited” high speed image recording
- up to 400 Gbit/s per CLHS FOL, on the fly image correction



pco.pixelfly SWIR

Key features

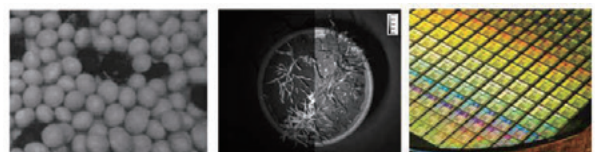
- sensitive in VIS & SWIR range
- InGaAs sensor technology
- 1.3 Mpixel resolution
- robust & ultra-compact design
- single cable solution (power & data) via USB



Excelitas TDI line scan

Key features

- time delay integration
- two photosensitive bands
- up to 600 kHz line frequency
- flexible thermal management
- temperature stabilized image sensor
- camera link HS or gigabit ethernet



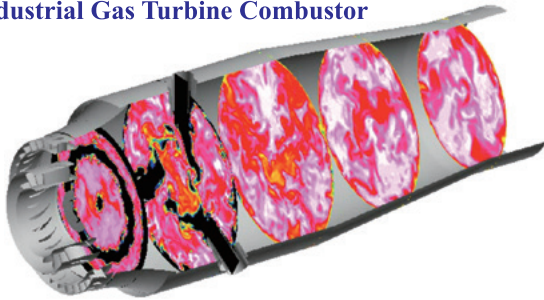
NuFD®/FrontFlowRed

Large Eddy Simulation (LES) can be conducted by using high performance computing (HPC) techniques for turbulence simulation in engineering fields. The unstructured-grid LES code “NuFD/FrontFlowRed” based on the finite volume method (FVM) is optimized for the execution on HPC. “NuFD/FrontFlowRed” provides not only turbulence simulation, but also simulation for the complex multi-physics problems, such as turbulent combustion, multi-phase flow and so on.

NuFD/FrontFlowRed : Next-generation IT program of MEXT/Revolutionary Simulation Software project Entity Developer: Institute of Industrial Science, the University of Tokyo

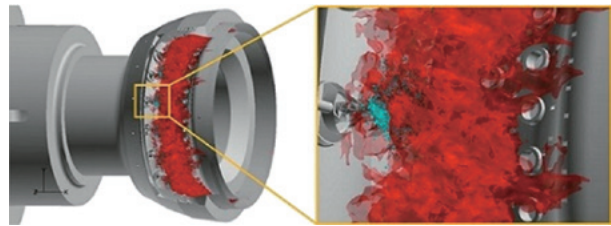
Study of Combustion by using Fluid Dynamics Simulation Software “NuFD/FrontFlowRed”

Industrial Gas Turbine Combustor



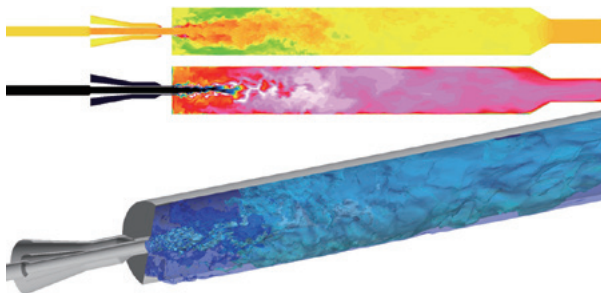
- LES-FLAMELET gaseous combustion
 - Flamelet NOx modeling
 - Prediction of temperature and NOx distribution inside of the combustor
 - 6million cells, 160 cores
- Provision of data: Kyoto University

Full Annular Combustor for Aircraft Engine



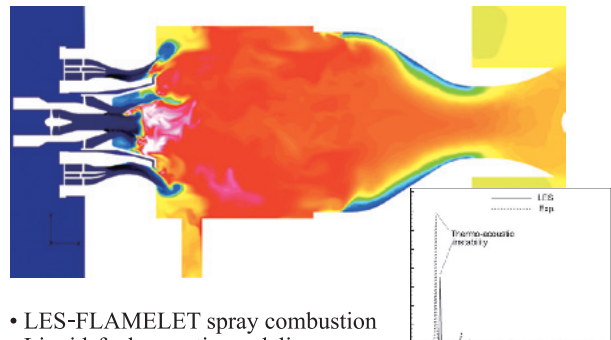
- LES-FLAMELET spray combustion
 - Lagrangian particle tracking and vaporization of liquid fuel
 - Prediction of combustor exit temperature distribution
 - Simulation of ignition and flame propagation
 - 120million cells, 10,000 cores, K computer
- Provision of data: Kyoto University, JAXA

Single Element Coaxial Combustor for Rocket Engine



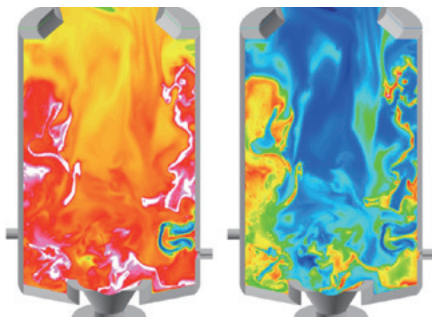
- LES-FLAMELET supercritical fluid combustion
 - Non-adiabatic flamelet modeling
 - Prediction of wall heat flux distribution
 - 8.2million cells, 256 cores
- Provision of data: Kyoto University

Combustion Instability of an Aero-Engine Combustor



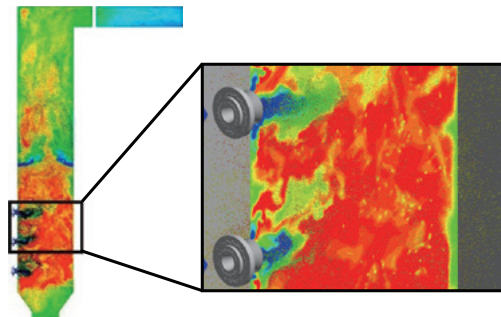
- LES-FLAMELET spray combustion
 - Liquid-fuel acoustic modeling
 - Prediction of frequency of combustion instability
 - 20million cells, 512 cores
- Provision of data: Kyoto University, JAXA

Lab-Scale Coal Gasifier



- LES of CRIEPI coal gasification
 - Simulation of devolatilization, char gasification, and gas-phase reaction
 - Prediction of gasification characteristics
 - 100million cells, 10,000 cores, K computer
- Provision of data: Kyushu University

Multi-Burner Test Furnace



- LES of CRIEPI pulverized coal combustion
 - Simulation of devolatilization, char gasification, and gas-phase reaction
 - Prediction of temperature and NOx emission
 - 100million cells, 10,000 cores, K computer
- Provision of data: Kyoto University, Kyushu University

“NuFD” and “NuFD/FFR” are registered trademarks of Numerical Flow Designing Co.,Ltd.



累計実績

約95社

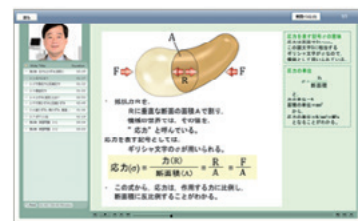
24,319名

研修開催日数

年間128日

CAE
UNIVERSITY

CAE総合教育サービス CAEユニバーシティ



CAE教育のプランニングも実施も、丸ごとおまかせ！

弊社提供のCAE教育サービスを組み合わせ、
お客様のご利用環境に合わせた最適な教育プランをご提案します。



ゼロから実務レベルまで 多彩な学習内容

実験で学ぶ基礎理論からCAEソフトウェアの操作、実務のノウハウ、CAE評価者向けセミナーまで。必要なものだけをカスタマイズして、CAE関連のお悩みに幅広くご対応できます。



導入しやすい 柔軟な学習形態

セミナーでは、ニーズや学習内容に合わせて、対面/オンラインでの座学・実習・ワークショップ開催が可能。また、動画コンテンツ、eラーニングなど多様な学習方法をご用意しています。



CAE社内活用を コンサルティング

お客様のCAE環境における課題抽出からお手伝い。調査・分析で解決すべき課題を把握し、長期的な教育方針のご提案も可能です。まずはお問い合わせください！

お問い合わせ先

サイバネットシステム株式会社

デジタルエンジニアリング事業本部
エンジニアリング統括部
E-mail : cae-univ@cybernet.co.jp

WEBページ

<https://www.cybernet.co.jp/cae-univ/>



VFBasis 2.1

AI/machine learning automatically extracts the critical fluid mechanisms that determine and dominate the aerodynamic performance of the product !
Further performance improvement and noise reduction of the product!

VFBasis is a commercial software developed by VINAS based on JAXA's research. It features enhanced large-scale data analysis with parallel processing, GUI-based function evaluation and video display, commercial solver support, efficient CFD file handling, and essential industrial functions like processing tools and PIV support.

POD/DMD analysis package for CFD simulation and PIV measurement results

Automatic extraction of important vortex vibration modes that determine product fluid performance

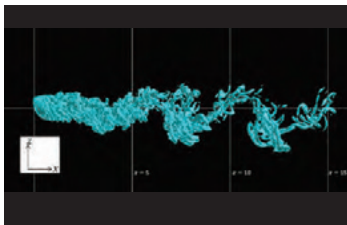
Extraction of user-specified number of important modes by AI machine learning as a result of modal analysis by POD/DMD

Fast, memory-saving POD/DMD analysis of big unsteady CFD results

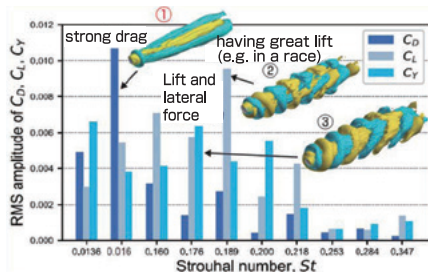
"Data Reduction Function" for compressing CFD analysis results for post-processing

Reduction in data transfer time, improvement in post-processing speed

Extracting the characteristic structure of the wake vortex of an atmospheric entry capsule.



▲ Large-scale, unsteady CFD analysis results



▲ Results of analysis of important feature structure
Aerodynamic forces exerted by each mode

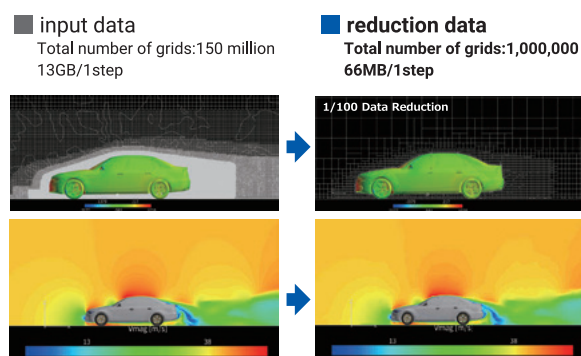
- (i) Drag fluctuation; dominant longitudinal vortex mode with $St = 0.0159$
- (ii) Lifting force fluctuation; dominant alternating vortex mode with $St = 0.189$
- (iii) Helical vortex mode ($St = 0.176$) has equal lift and lateral force

Operating environment	- Linux system Linux 64-bit (Ubuntu 18.04 LTS, Ubuntu 22.04 LTS, RedHat 7, CentOS 7) - Windows system Windows 64-bit (Windows 10, Windows 11)
Supported Solvers and Data Formats	Acusolve, ADINA CFD, ANSYS CFX, ANSYS FLUENT, CONVERGE, CRUNCH-CFD, FrontFlow/Blue, FrontFlow/red, HELIX, iconCFD, OpenFOAM, PowerFLOW, CUBE, SCRYU/Tetra, STAR-CD, STAR-CCM+, STREAM, VECTIS Direct reader : OpenFOAM, iconCFD, HELIX, etc., to be supported in the future General-purpose formats : FV-UNS, EnSight Gold, PLOT3D (Q files)
Supported post processors	FieldView, EnSight, post processor with commercial CFD solver, ParaView, FieldView, EnSight Gold, and PLOT3D format files are supported. ParaView is available but not supported.

*The names of companies and trademarks are the registered trademarks of their respective owners.

Example of application of the Data Reduction Module to the DrivAer model

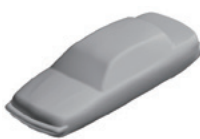
Reduces the number of elements in large CFD analysis data, streamlining visualization and engineering evaluation. The GUI allows users to downsize solver results, minimizing data transfer time and significantly speeding up post-processing.



Example of the use of characterization graphs in vehicle aerodynamic analysis

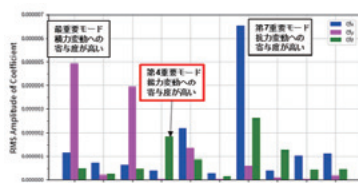
By using VFBasis' aerodynamic characteristic graph function, which visualizes fluid force fluctuations by mode, it is now possible to identify modes highly contributing to aerodynamic cubic force something conventional CFD struggled to evaluate. By comparing spatial flow patterns with surface fluid forces, aerodynamic fluctuations can be easily analyzed, providing valuable feedback for shape design.

Calculation target



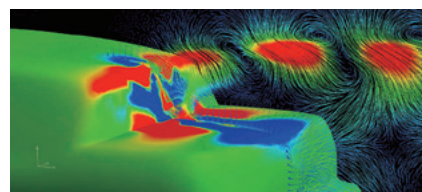
▲ Bluff body of automobile

Aerodynamic characteristics graph



▲ Intensity of variation of important modes and aerodynamic characteristic values extracted by machine learning

Visualization of flow patterns and fluid forces



▲ Velocity vector and lift force component (F_z) distribution acting on the body surface at the center cross-section

Sales Support



Visual Integration & Numerical Analysis Systems
 www.vinas.com E-MAIL : selas@vinas.com

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 TEL +81-3-5791-2643 FAX +81-3-5791-2649

VINAS Developer: Vinas Corporation



BluStellar

未来へ導く、光となる。

お問い合わせ先

BluStellarお問い合わせ窓口
blustellar@inquire.jp.nec.com

Webサイト
<https://jpn.nec.com/dx/index.html>





RIKEN Center for Computational Science (R-CCS)

R-CCS operates the supercomputer Fugaku, leveraging its world-class computing power across various research fields. R-CCS is engaged in cutting-edge research integrating simulation, big data analysis and AI through high performance computing (HPC) to solve scientific and social issues, and to drive revolutionary societal development.



▲ R-CCS Website
www.r-ccs.riken.jp

Future Initiatives of R-CCS

AI for Science, accelerating research processes by applying rapidly advancing AI directly to scientific research, with a focus on developing foundational models for science with the Advanced General Intelligence for Science Program (AGIS) by RIKEN.

JHPC-Quantum Platform, constructing a quantum-supercomputer hybrid platform that enables computing in areas previously challenging for traditional supercomputers.

FugakuNEXT, a next-generation supercomputer that combines simulation and AI to achieve global technological leadership.

Industrial Collaboration

At R-CCS, two consortia play a central role in the industry alliance and share knowledge gained through the use of the supercomputer Fugaku.

- Consortium for Next Generation Automotive CAE using HPC
- Consortium for Next Generation Combustion System CAE

R-CCS Collaborations ▶



Featured Event

SCA/HPCAsia 2026:

SupercomputingAsia(SCA)and the International Conference on High Performance Computing in the Asia-Pacific Region (HPC Asia), will jointly host the major international conference and event on HPC in Osaka from January 26 to 29, 2026.

We enthusiastically encourage you to join us for this special event.

See you in Osaka!



SCA/HPCAsia 2026 Website
www.sca-hpcasia2026.jp/ ▶



Composite Form Modeling Tool

Features

```
graph TD; A[Pre-model Preparation] --> B[Composite Material Property Identification]; B <--> C[Material Data Registration]; B --> D[Laminates Configuration]; D --> E[LS-DYNA Solver]; E --> F[Result Review]; C --> G[Fiber Result Mapping]; G --> H[Structural Analysis]; subgraph J-Composites_Form_Modeler; B; C; D; G; end; E --> G;
```

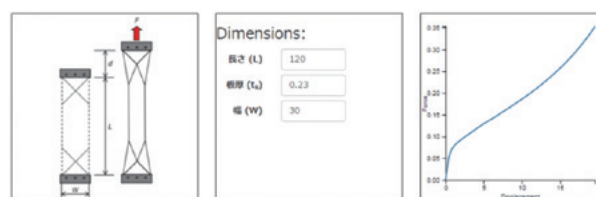
The flowchart illustrates the J-Composites Form Modeler process. It begins with **Pre-model Preparation**, leading to **Composite Material Property Identification** and **Material Data Registration** (interconnected by a bidirectional arrow). This is followed by **Laminates Configuration**, which leads to the **LS-DYNA Solver**. The **LS-DYNA Solver** then leads to **Result Review**. A **Fiber Result Mapping** step is also shown, which receives input from **Material Data Registration** and **Result Review**, and leads to **Structural Analysis**. The central components (Composite Material Property Identification, Material Data Registration, Laminates Configuration, and Fiber Result Mapping) are grouped within a teal box labeled **J-Composites Form Modeler**. The **Laminates Configuration** step is associated with the **Lay-up Modeler**, and the **Fiber Result Mapping** step is associated with the **Lay-up Mapper**.

■ Prediction of Molding Defects

(Courtesy of ASANO Co., Ltd)

■ Automatic Construction of Material Models for Forming Simulation

45 deg. (ab) - Bias-Extension Test *



■ Easy-to-use User Interface

[Templates](#) [Recent](#) [Layers](#) [Create](#)

Lay-up Modeler

Attribute Modelling Type Version Preview

MULTIPLE PARTS 0

PLY Pattern	Material	Ply Options	Fibrics	Contact Options
GUTEX	TPEX_Dynalene_302	Ply Options	0.2	Apply Batch Settings

Nr	Material	Additional Angle	Thickness [mm]	Fibrics	Contact Options
1	TPEX_Dynalene_302 CSM [head laminates]	0	0.250	Ply Options	Contact Options
2	TPEX_Dynalene_302 CSM [head laminates]	90	0.250	Ply Options	Contact Options
3	TPEX_Dynalene_302 CSM [head laminates]	90	0.250	Ply Options	Contact Options
4	TPEX_Dynalene_302 CSM [head laminates]	0	0.250	Ply Options	Contact Options

■ Fiber Direction Informed Structural Analysis

Fiber Orientation After Forming

Crash Simulation

Fiber Orientation After Forming

Crash Simulation

高性能・省電力を実現するArmベースプロセッサ「FUJITSU-MONAKA」を搭載、最新のデータセンターの多様な要件に応えビジネス成果を創出する次世代サーバ

「FUJITSU-MONAKA」は、「富岳」をはじめとするスーパーコンピュータ開発で培われた富士通独自の設計技術と最先端2nmプロセスを融合。比類なき性能と電力効率でTCO削減を実現、AIからシミュレーション処理までお客様の多様な要件にも幅広くお応えします。

FUJITSU-MONAKAサーバが実現する価値

TCO※削減 ※総保有コスト

高性能と省電力の両立によりTCO削減に貢献



高いAI処理性能

AI推論からデータベースまであらゆるワークロードで性能発揮・FUJITSU-MONAKA基盤上で完結



ML/DL Workload



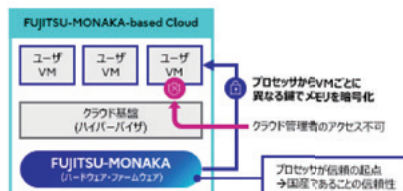
Data Analytical Workload



Simulation Workload

安心安全

メインフレームで培った堅牢技術と国産プロセッサによる暗号化機構で重要データを強固に保護



ユースケース



企業A様（業種：CSP）
プライベートLLMのコスト最適化



企業B様（業種：製造）
流体解析の高速化



企業C様（業種：小売業）
多数カメラを用いたAI画像分析コスト抑制

効果



GPUレスでのLLM推論
性能達成・設備コスト抑制



シミュレーション高速化・
設計期間短縮



処理性能向上による
サーバ台数と総コスト削減

お客様のニーズに合わせたご提案を承ります。ぜひお気軽にお問い合わせください。

サーバ仕様

	SAS SSD Model	PCIe SSD Model
CPU	FUJITSU-MONAKA CPU x2 最大288コア (144コア/CPU x2)	
メモリスロット数	DIMM DDR5 x24 (最大) 最大 6TiB (256GiB x24)	
拡張スロット	Low Profile x5 (PCI Express 6.0 / CXL 3.0 x 16 lane) フルサイズGPU (オプション) x2	
内蔵ストレージ	2.5" SAS SSD x24 (最大) 最大 368.64 TB (15.36TB x24) EDSFF E3.S SSD x24 (最大) 最大 61.44 TB (15.36TB x4)	
サイズ	19インチ (W) x 800mm (D) x 2U (H)	
電源	AC200V 2,000W(Titanium) / 2,700W(Titanium) (1+1 完全冗長, ホットプラグ対応)	
冷却方式	空冷	
設置環境条件(温度)	10~35℃	
対応OS	RHEL, SLES	

記載の仕様、デザインについては通知なく変更となる可能性があります。他バリエーションについてはぜひお気軽にお問い合わせください。

¹2027年リリース時期を想定した当社性能推定値に基づく。性能は、使用状況、構成、その他の要因によって異なります。

²2027年リリース時期を想定した当社性能推定値に基づく。性能指標としてSPECrate2017_intを使用。他社CPUの同等価格帯性能（富士通推定）で見積もり。TCOには 設備投資費用・電気代・不動産費用・管理者費用を含む。サーバ稼働年数5年を想定。本資料に記載の内容は現在開発中であり、予告なしに仕様・性能・デザインを変更する可能性があります。

この成果は、NEDO（国立研究開発法人新エネルギー・産業技術総合開発機構）の助成事業の結果得られたものです。

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