

April 16th, 2007 (9:00~18:20)

9:00 Opening

Oral Session 1: Physics and Mathematics of Acoustic Imaging

Session Chair: Jeffrey A. Kettering, USA

- 9:20 1-a-1 Imaging surface acoustic waves in real time through strain-induced birefringence using picosecond optical pulses
Osamu Matsuda, Kenji Kawada, Takehiro Tachizaki, Hiroto Yamazaki, and Oliver B. Wright (Division of Applied Physics, Graduate School of Engineering, Hokkaido University, Japan)
- 9:40 1-a-2 Beam forming for sumfrequency acoustic imaging technique
Glauber T. Silva, Farid Mitri, and Mostafa Fatemi (Centro de Pesquisa em Matematica Computacional, Universidade Federal de Alagoas, Brazil)
- 10:00 1-a-3 Eigenvalue Imaging of A0-mode Lamb Wave Field based on Spatio-temporal Gradient Analysis
Kenbu Teramoto, Akito Uekihara (Graduate School of Advanced Systems Control Engineering Saga University, Japan)
- 10:20 1-a-4 Visco-elastic Models of Tissue
Sidney Leeman and Joie Jones (University of California, Irvine, USA)

10:40~11:00 Break

Oral Session 2: Image Analysis

Session Chair: Michael Andre, USA

- 11:00 1-a-5 Synthetic Aperture Focusing of Echographic Images by Means of Pulse Compression
Elena Biagi, Marco Scabia, Lorenzo Pampaloni, Leonardo Masotti (Laboratory of Ultrasound and Non Destructive Testing, Dept. of Electronics and Tel., University of Florence, Italy)
- 11:20 1-a-6 Three-dimensional imaging by using singular-spreading phase unwrapping method
Tomohiro Nishino, Ryo Yamaki and Akira Hirose (Graduate School of Electronic Engineering, University of Tokyo, Japan)
- 11:40 1-a-7 Wavelet Restoration of Three-Dimensional Medical Pulse-Echo Ultrasound Datasets in an EM Framework
James Ng, Henry Gomersall, Richard Prager, Nick Kingsbury, Graham Treece, Andrew Gee (Department of Engineering, University of Cambridge, UK)

12:00~13:00 Lunch

Invited Lecture 1

Session Chair: Tomoo Kamakura, Japan

- 13:00 I-1 FDTD calculation of linear acoustic phenomena and its application to architectural acoustics and environmental noise prediction
Shinichi Sakamoto (Institute of Industrial Science, The University of Tokyo, Japan)

Special Session 1: FDTD Method

Session Chair: Tomoo Kamakura, Japan

- 13:40 1-p-1 Quantitative Ultrasound Assessment of Tubes and Rods: Comparison of Empirical and Computational Results
Jonathan J. Kaufman, Gangming Luo, Benjamin Blazy and Robert S. Siffert (CyberLogic, Inc., USA)
- 14:00 1-p-2 Heated Temperature Imaging by Absorption of Ultrasound
Chiaki Yamaya and Hiroshi Inoue (Department of Electrical and Electronic Engineering, Faculty of Engineering and Resource Science, Akita University, Japan)
- 14:20 1-p-3 Estimation of temperature distribution in agar phantom with mimic bone
Nobuyuki Endoh, Takenobu Tsuchiya, Shou Oride, Kazuki Nagai and Sintarou Sugimura (Kanagawa University, Japan)
- 14:40 1-p-4 Time domain analysis of sound propagation in shallow water with transitional layer
Takenobu Tsuchiya, Sayuri Matsumoto and Nobuyuki Endoh (Faculty of Engineering, Kanagawa University High-Tech Research Center, Kanagawa University, Japan)
- 15:00 1-p-5 Comparison of Some Aspherical Curved Surfaces of a Single Biconcave Acoustic Lens System for Ambient Noise Imaging
Kazuyoshi Mori, Hanako Ogasawara and Toshiaki Nakamura (Department of Earth and Ocean Sciences, National Defense Academy, Japan)

Poster Session 1

Session Chair: Hiroyuki Hachiya, Japan

15:20-16:40

- p-1 Vector Theory of Ultrasonic Diffraction Imaging
Woon Siong Gan (Acoustical Technologies Singapore Pte Ltd, Singapore)
- p-3 Reproducibility of Image Analysis for Breast Ultrasound Computer-Aided Diagnosis
Michael Galperin, Michael Andre, Chad Barker, Laxmi Mantrawadi, Linda Olson, Mary O'Boyle Katherine Richman (University of California, San Diego, San Diego Veterans Affairs Healthcare System, USA)

- p-5 Evaluation of post wall filter for Doppler ultrasound system
Tatsuro Baba (Ultrasound Systems Development Department, Toshiba Medical Systems Corporation, Japan)
- p-7 Combining Ultrasonic and Magnetic-resonance Spectral Methods for imaging Prostate Cancer.
Ernest Feleppa, Christopher Porter, Shreedevi Dasgupta, Sarayu Ramachandran, Andrew Kalisz, Jeffrey Ketterling, Marc LaCrampe, David Dail (Riverside Research Institute, USA)
- p-9 New Imaging Method by Using Ultrasound Velocity Change Caused by Optical Absorption
H. Horinaka, T. Matsunaka, N. Nakamura, T. Mukaiyama, S. Kakami, M. Kawasaki, K. Wada (Department of Engineering, Osaka Prefecture University, Japan)
- p-11 Radio frequency signal analysis for tissue characterization of coronary artery: in vivo intravascular ultrasound study
Takahiro Iwamoto, Yoshifumi Saijo, Akira Tanaka, Esmeraldo, dos Santos Filho, Shuo Li and Makoto Yoshizawa (Graduate school of engineering, Tohoku University, Japan)
- p-13 Ultrasonic Detection and Imaging of Brachytherapy Seeds Based on Singular Spectrum Analysis
Jonathan Mamou and Ernest J. Feleppa (Riverside Research Institute, F. L. Lizzi Center for Biomedical Engineering, USA)
- p-15 Tissue thermal property reconstruction by stopping heating and perfusion
Chikayoshi Sumi, Tsuneaki Ohba and Kyousuke Inoue (Dept of E & E Eng, Faculty of Sci & Tech, Sophia University, Japan)
- p-17 Experimental Evaluation of Tissue Motion Vector Measurement System utilizing Synthetic Aperture Array-Signal Processing for Real-Time Elastography
S. Yagi, A. Sanuga, K. Tamura and M. Sato (Graduate School of Information Science, Meisei University, Japan)
- p-19 Underground Imaging Using Shear Waves -Resolution improvement using super-magnetostriction vibrator-
Hiraku Kawasaki, Tuneyoshi Sugimoto (Intelligent and Mechanical Engineering, Toin University of Yokohama, Japan)
- p-21 Indication of probe-axis angle by extracting wall motion of heart to assist to obtain long- and short-axis view on echocardiography
Kohji Masuda, Hirotaka Matsuura and Rui Takahashi (Graduate School of BASE, Tokyo University of Agriculture and Technology, Japan)
- p-25 Combinatorial Synthesis of Thin Mixed Oxide-Films and Examination of their Piezoelectricity by Ultrasonic Piezo-Mode Imaging
D. Rende, W. F. Maier, K. Schwarz, U. Rabe, and W. Arnold (Fraunhofer-Institute for Nondestructive Testing (IZFP), Germany)
- p-27 Observation of Two Dimensional Spatial Distribution of Plane Crack Tips by the Low Power Pulsed Laser
Hiroshi Fujii, Tomohiro Miyake and Mami Matsukawa (Faculty of Engineering, Doshisha University, Japan)
- p-29 Evaluation of Adhesive Physical, Chemical and Micromechanical Properties with Acoustic Imaging Methods
Ina Severina, Jeff Sadler, Elena Maeva, Fedar Seviaryn, Roman Gr Maev (DaimlerChrysler/NSERC Industrial Research Chair in Applied Solid State Physics and Material Characterization, University of Windsor, Canada)
- p-31 Reconstruction of the ultrasonic image by the combination of Genetic

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- Programming and Constructive Solid Geometry
Motoi Yamagiwa, Masahide Yoneyama (Dept. of Info. and Comp. Sciences, Faculty of Engineering, Toyo Univ.)
- p-33 Two-Dimensional Numerical Analysis of Acoustic Field Using the CIP Method
Sungqwan Oh, Kan Okubo, Takao Tsuchiya, Nobunao Takeuchi (Akita Prefectural University, Japan)
- p-35 Optical observation of a collapsing bubble adhered to the piezoelectric transducer surface under ultrasound field
Shintaro NAKATANI, Kenji YOSHIDA, Yoshiaki WATANABE (Faculty of Engineering, Doshisha University, Japan)
- p-37 Optical observation of two collapsing bubbles adhered to quartz wall; influences of bubble-bubble interaction on collapse behaviors
Kenji Yoshida, Shintaro Nakatani, Yoshiaki Watanabe (Faculty of Engineering, Doshisha University, Japan)
- p-39 Observation and Evaluation of TiO₂-SiO₂ Ultra-Low-Expansion Glasses Using the Line-Focus-Beam Ultrasonic Material Characterization System
Mototaka Arakawa, Yuji Ohashi, and Jun-ichi Kushibiki (Dept. of Electrical Engineering, Tohoku University, Japan)

Oral Session 3: Components and Systems

Session Chair: Nobuyuki Endoh, Japan

- 16:40 1-p-6 Direct Visualization of High Intensity Focused Ultrasonic Field Using LEDs and PZT Elements
Kentaro Nakamura, Hiroyasu Ogura and Tsuneyoshi Sugimoto (Precision and Intelligence Laboratory, Tokyo Institute of Technology, Japan)
- 17:00 1-p-7 Dynamic-receive Focusing with High-frequency Annular Array
Jeffrey A. Ketterling, Jonathan Mamou and Ronald H. Silverman (Riverside Research Institute, USA)
- 17:20 1-p-8 Sensor signal processing for ultrasonic sensors using delta-sigma modulated single-bit digital signal
Shinnosuke Hirata, Minoru K Kurosawa, Takashi Katagiri (Dept. of Information Processing, Tokyo Institute of Technology, Japan)
- 17:40 1-p-9 Fully Fiber Optic Ultrasonic Probes for Virtual Biopsy
Elena Biagi, Stefano Cerbai, Paolo Gambacciani, Leonardo Masotti (Laboratory of Ultrasound and Non Destructive Testing, Dept. of Electronics and Tel., University of Florence, Italy)
- 18:00 1-p-10 Range Measurement using Ultrasound FMCW Wave
Masanori Kunita, Tetsuya Miki and Ikuo Arai (Research laboratory, Aloka CO., LTD, Japan)

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Invited Lecture 2

Session Chair: Walter Arnold, Germany

- 9:00 I2 Ultrasonic Atomic Force Microscopy of Subsurface Defects
Kazushi Yamanaka, Kentaro Kobari, Seishiro Ide and Toshihiro Tsuji (Dept. Material Processing, Graduate School of Engineering, Tohoku University, Japan)

Invited Lecture 3

Session Chair: Walter Arnold, Germany

- 9:40 I3 Quantitative material characterization and imaging at nanoscale using a new AFM probe
F. L. Degertekin, M. Balantekin, and A. G. Onaran (Georgia Institute of Technology, USA)

Oral Session 4-1:

Non-Destructive Evaluation and Industrial Applications

Session Chair: Kazushi Yamanaka, Japan

- 10:20 2-a-1 High-Frequency Ultrasonic Detection and Evaluation of Near-Surface Porosity in Non-Ferrous Diecast Components
S. Hirsekorn, U. Rabe, D. Bruche, and W. Arnold (Fraunhofer-Institute for Non-Destructive Testing, Germany)

Poster Session 2

Session Chair: Kazushi Yamanaka, Japan

10:40-12:00

- p-2 Gauge Invariance Approach to Acoustic Fields
Woon Siong Gan (Acoustical Technologies Singapore Pte Ltd, Singapore)
- p-4 Observation of flow of thrombi using brightness distribution of echo image
Masami Aoki, Tadashi Yamaguchi and Hiroyuki Hachiya (Graduate School of Science and Technology, Chiba University, Japan)
- p-6 A Study of the Potential to Detect Caries Lesions at the White-Spot Stage Using V(Z) Technique
Evgeny Yu. Bakulin, Liudmila A. Denisova and Roman Gr. Maev (Center for Imaging Research and Advanced Material Characterization, Faculty of Science, University of Windsor, Canada)

- p-8 Dynamic Resolution Selection in Strain Imaging
Joel Lindop, Graham Treece, Andrew Gee and Richard Prager (University of Cambridge, UK)
- p-10 Experimental study of probe navigation algorithm for echocardiography to acquire standard cross section
Takao Imai, Hiroto Inoue, Taro Sakai and Kohji Masuda (Graduate School of BASE, Tokyo Univ. of A&T, Japan)
- p-12 Cross-sampling measurement of vocal fold vibration using ultrasound
Shunji Kamei, Yasushi Masuda, Yoshiro Kuroda, Osamu Oshiro (Graduate School of Engineering Science, Osaka University, Japan)
- p-14 Harmonic Operations of Phase Continuous Fresnel Lens
Yasuhito Takeuchi (Kagoshima University, Japan)
- p-16 3-D Acoustic Imaging System with a Reflector and a Small Array
Hirofumi Taki and Toru Sato (Department of Communications and Computer Engineering, Graduate School of Informatics, Kyoto University, Japan)
- p-18 Development of CAD System based on Elasticity Images
Masakazu Yamazaki, Akiko Tonomura, Tsuyoshi Mitake, Tsuyoshi Shiina, Makoto Yamakawa and Hotaka Takizawa (Graduate School of Systems and Information Engineering, University of Tsukuba, Japan)
- p-20 High speed vortex wind velocity imaging by acoustic tomography
Haiyue Li, Takaaki Ueki, Kazuhiro Hayashi and Akira Yamada (Graduate School of Bio Applications & Systems Eng. Tokyo University of Agriculture & Technology, Japan)
- p-22 Tissue shear modulus reconstruction using ultrasonic strain tensor measurement
Chikayoshi Sumi (Dept of E&E, Faculty of Sci & Tech, Sophia University, Japan)
- p-24 Resistance Spot Weld Quality Monitoring in Real Time Using Electrode-Integrated Ultrasonic Weld Analyzer
Andrey M. Chertov, Roman Gr. Maev (DaimlerChrysler/NSERC Industrial Research Chair in Applied Solid State Physics and Material Characterization, Canada)
- p-26 Detection of Harmonic Components Generated from Crept Metal Rod Using a Double-Layered Piezoelectric Transducer System
Makoto Fukuda, Morimasa Nishihira and Kazuhiko Imano (Department of Electrical and Electronic Engineering, Faculty of Engineering and Resource Science, Akita University, Japan)
- p-28 Ultrasonic microscopy for the NDT of mechanical welding
Yulia Petronyuk, Vadim Levin (Laboratory of Acoustic Microscopy, Institute of Biochemical Physics RAS, Russia)
- p-30 Source Localization by Simulation of Time Reversal Wave and its Resolution Improvement with Deconvolution Technique
Naoto Wakatsuki and Koichi Mizutani (Graduate School of Systems and Information Engineering, University of Tsukuba, Japan)
- p-32 Visualization of Temperature Distribution in Cylindrical Cavity Using Reflected Sounds from Internal Surface
Ayumu Minamide, Koichi Mizutani, and Naoto Wakatsuki (Graduate School of Systems and information Engineering, University of Tsukuba, Japan)
- p-34 Real time sound field simulator using field programmable gate array device
Takao Tsuchiya, Eiko Sugawara and Yasushi Inoguchi (Dept. of Information Systems Design, Doshisha Univ., Japan)

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- p-36 Target detection by using an acoustic M-sequence signal in the air
Tadashi Yamaguchi, Kuramitsu Nishihara, Hiroshi Matsuo, Young Wang,
Masahiko Hashimoto, and Hiroyuki Hachiya (Department of Information
and Image Sciences, Faculty of Engineering, Chiba University, Japan)
- p-38 Image Enhance Method for Scanning Ultrasonic Microscope Considering Its
Beam Characteristics
Kazuto Kobayashi, Toshimichi Ishiguro, Naohiro Hozumi , and Yoshihumi
Saijo(Honda Electronics Co.,Ltd., Japan)

12:00~13:00 Lunch

Invited Lecture 4

Session Chair: Hiroshi Kanai, Japan

- 13:00 I4 Use of Radiation Force to Measure Arterial Properties
James Greenleaf, Xiaoming Zhang, Cristina Pislaru
(Mayo Clinic College of Medicine, USA)

Oral Session 4-2: Biomedical Application 1: Tissue Elasticity

Session Chair: James F. Greenleaf, USA

- 13:40 2-p-1 Ultrasonic Imaging of Hemodynamic Force in Carotid Blood Flow
Naotaka Nitta and Kazuhiro Homma (Institute for Human
Science and Biomedical Engineering, National Institute of Advanced
Industrial Science and Technology, Japan)
- 14:00 2-p-2 A New Non-Invasive Ultrasonic Method for Measurements of
Longitudinal Length Alteration of the Arterial Wall · First *in vivo*
trial
Magnus Cinthio, Asa Ryden Ahlgren, Hans W Persson¹ and Kjell
Lindstrom (Lund Institute of Technology, Sweden)
- 14:20 2-p-3 Strain Imaging for Arterial Wall with Translational Motion
Compensation and Center Frequency Estimation
Hideyuki Hasegawa and Hiroshi Kanai (Graduate School of
Engineering, Tohoku University, Japan)
- 14:40 2-p-4 Near-Real-Time 3D Ultrasonic Strain Imaging
Graham Treece, Joel Lindop, Andrew Gee and Richard Prager
(University of Cambridge, UK)

15:00~15:20 Break

Oral Session 5: Biomedical Application 2: High Resolution Imaging

Session Chair: Shinichiro Umemura, Japan

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- 15:20 2-p-5 High-frequency Pulse-compression Ultrasound Imaging with an Annular Array
Jonathan Mamou, Jeffrey A. Ketterling, Ronald H. Silverman (Riverside Research Institute, F. L. Lizzi Center for Biomedical Engineering, USA)
- 15:40 2-p-6 High Resolution Ultrasonic Method for 3D Fingerprint Representation in Biometrics
Roman Gr. Maev, Eugene Yu. Bakulin, Elena Yu. Maeva, Fedar M. Severin (Center for Imaging Research and Advanced Material Characterization, University of Windsor, Canada)
- 16:00 2-p-7 Investigation of the human fingernail microstructure using ultrasound
Anna R. Maeva, Evgeny Yu. Bakulin, Liudmila A. Denisova and Roman Gr. Maev (Center for Imaging Research and Advanced Material Characterization, Faculty of Science, University of Windsor, Canada)
- 16:20 2-p-8 Optoacoustic imaging
M. Frenz, M. Jaeger, A. Gertsch, M. Kitz, D. Schweizer (Institute of Applied Physics, University of Berne, Switzerland)

16:40~17:00 Break

Oral Session 6: Biomedical Application 3:

New Imaging Method and Analysis

Session Chair: Joie P. Jones, USA

- 17:00 2-p-9 Pre-Clinical Experience with Full-Wave Inverse Scattering for Breast Imaging: Sound Speed Sensitivity
Michael Andre, Chad Barker, Navdeep Sekhon, James Wiskin and David Borup (University of California, San Diego, San Diego Veterans Affairs Healthcare System, USA)
- 17:20 2-p-10 Nonlinear Multibeam Ultrasonic Imaging -Simultaneous Transmission of Ultrasonic Waves of Two Frequencies -
Iwaki Akiyama, Shigemi Saito and Akihisa Ohya (Shonan Institute of Technology, Japan)
- 17:40 2-p-11 Blood Flow Imaging in Maternal and Fetal Arteries and Veins
Stefano Ricci, Gabriele Urban, Michael J. Paidas and Piero Tortoli (Dept. of Electronics and Telecommunications, University of Florence, Italy)
- 18:00 2-p-12 Carotid Plaque Tissue Differentiation Based on Radiofrequency Echographic Signal Local Spectral Content (RULES: Radiofrequency Ultrasonic Local Estimators)
Elena Biagi , Simona Granchi , Luca Breschi , Rodolfo Facchini , Alessandra Luddi , Andrea Ricci , Leonardo Masotti (Laboratory of Ultrasound and Non Destructive Testing, Dept. of Electronics and Telecommunications, University of Florence, Italy)

April 18th, 2007 (9:00~15:20)

Invited Lecture 5

Session Chair: Iwaki Akiyama, Japan

- 9:00 I5 Visualization of Acoustic Waves Propagating within an Anisotropic Single Crystal Plate with a Hybrid Acoustic Imaging Technique
Chiaki Miyasaka, Ken L. Telschow, Jeffrey T. Sadler, and Roman Gr. Maev (The Pennsylvania State University, USA)

Oral Session 7: Acoustic Microscopy

Session Chair: Tsuyoshi Shiina, Japan

- 9:40 3-a-1 Acoustic Microscopy Observations of Effects of Pre-Stresses on Impact-Induced Damage of CFRP Laminates
Bernhard R. Tittmann, Chiaki Miyasaka, and Hideaki Kasano (The Pennsylvania State University, USA)
- 10:00 3-a-2 Study of Nano-Scaled Metal Film Systems Using Scanning Acoustic Microscopy
Evgeny Yu. Bakulin, Elena Yu. Maeva, Chiaki Miyasaka, and Mordechai Schlesinger (Department of Physics, University of Windsor, Canada)
- 10:20 3-a-3 Acoustic Microscopy of Resistance Spot Welds
Roman Gr. Maev, Andrey M. Chertov, Elena Y. Maeva (DaimlerChrysler/NSERC Industrial Research Chair in Applied Solid State Physics and Material Characterization, University of Windsor, Canada)

10:40~11:00 Break

Oral Session 8: Biomedical Application4: Blood Flow Measurement

Session Chair: Piero Tortoli, Italy

- 11:00 3-a-4 Measurement of Pressure-Dependent Attenuation of Ultrasound Contrast Agents
Nobuki Kudo, Norifumi Hirao, Kengo Okada, Katsuyuki Yamamoto (Graduate School of Information Science and Technology, Hokkaido University, Japan)
- 11:20 3-a-5 New Method for Ultrasound Contrast Imaging Using Frequency Modulated Transmission
Hiroyuki Ohuchi, Tetsuya Kawagishi, Tomohisa Imamura, Naohisa Kamiyama, Toshihiko Asanuma, Fuminobu Ishikura, Shintaro Beppu (Toshiba Medical Systems Corp., Japan)
- 11:40 3-a-6 ML Estimation for Acoustical Image Deblurring
Alessandro Paladini, Nicola Testoni, Luca De Marchi, Nicola Speciale (ARCES/DEIS University of Bologna, Italy)

12:00~13:00 Lunch

Invited Lecture 6

Session Chair: Yoshifumi Saijo, Japan

- 13:00 I6 New Generation of High Resolution Ultrasonic Imaging Technique for Advanced Material Characterization. Review
Roman Gr. Maev (DaimlerChrysler/NSERC Industrial Research Chair in Applied Solid State Physics and Material Characterization, University of Windsor, Canada)

Special Session 2:

Acoustic Microscopy for Measurement of Biological Tissues

Session Chair: Roman Maev, Canada and Yoshifumi Saijo, Japan

- 13:40 3-p-1 Elastic Changes of Capsule in a Rat Knee Contracture Model Assessed by Scanning Acoustic Microscopy
Yoshihiro Hagiwara, Eiichi Chimoto, Akira Ando, Yoshifumi Saijo, and Eiji Itoi (Department of Orthopaedic Surgery, Tohoku University Graduate School of Medicine, Japan)
- 14:00 3-p-2 Ultrasonic Nano-imaging System for Medicine and Biology
Yoshifumi Saijo, Naohiro Hozumi, Kazuto Kobayashi, Nagaya Okada, Yoshihiro Hagiwara, Hidehiko Sasaki, Esmeraldo dos Santos Filho and Tomoyuki Yambe (Department of Medical Engineering and Cardiology, Institute of Development, Aging and Cancer, Tohoku University, Japan)
- 14:20 3-p-3 Development of Acoustic Impedance Microscope and Its Biological and Medical Applications
Naohiro Hozumi, Satoshi Terauchi, Masayuki Nagao, Sachiko Yoshida, Kazuto Kobayashi, Seiji Yamamoto and Yoshifumi Saijo (Aichi Institute of Technology, Japan)
- 14:40 3-p-4 Microscopic Measurement of Three-Dimensional Distribution of Tissue Viscoelasticity
Tsuyoshi Shiina, Masashi Yoshida, Makoto Yamakawa and Naotaka Nitta (Graduate School of Systems and Information Engineering, University of Tsukuba, Japan)
- 15:00~15:20 Closing