

# The 40th Symposium on Ultrasonic Electronics (USE 2019) Program

○ Speaker

\* Applying to Young Scientists Award

## Monday, November 25

**10:00-10:15    OPENING**

**10:15-11:30    Biomedical ultrasound I, High power ultrasound I**

**Chair: Ryo Nagaoka (Univ. of Toyama)**

- 1J1-1\***    **Estimation of Intravascular Attenuation by Analyzing Ultrasonic Backscatter to Evaluate Red Blood Cell Aggregation**  
○Kanta Nagasawa<sup>1</sup>, Akiyo Fukase<sup>1</sup>, Shohei Mori<sup>1</sup>, Mototaka Arakawa<sup>1</sup>, Satoshi Yashiro<sup>2</sup>, Yasushi Ishigaki<sup>2</sup>, Hiroshi Kanai<sup>1</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>Iwate Medical Univ.)
- 1J1-2\***    **Effect of Acoustic Impedance Distribution and Histopathological Structure on Backscatter Coefficient Analysis of Skin Tissue**  
○Masaaki Omura, Kenji Yoshida, Shinsuke Akita, Tadashi Yamaguchi (Chiba Univ.)
- 1J1-3**    **Basic Study on Optimal Cropping Setting in Convolution Neural Network for Ultrasonic Liver Tumor Diagnosis**  
○Makoto Yamakawa<sup>1</sup>, Tsuyoshi Shiina<sup>1</sup>, Naoshi Nishida<sup>2</sup>, Masatoshi Kudo<sup>2</sup> (<sup>1</sup>Kyoto Univ., <sup>2</sup>Kindai Univ.)
- 1J1-4**    **Effects of electric fields on sonoluminescence intensity and bubble dynamics**  
○Hyang-Bok Lee<sup>1</sup>, Pak-Kon Choi<sup>2</sup> (<sup>1</sup>Japan Women's Univ., <sup>2</sup>Meiji Univ.)
- 1J1-5**    **Evaluation of the sound field in ultrasonic atomization using a horn**  
○Teruyuki Kozuka<sup>1</sup>, Takuya Yoshimoto<sup>1</sup>, Masanori Sato<sup>2</sup>, Shin-ichi Hatanaka<sup>3</sup>, Kyuichi Yasui<sup>4</sup> (<sup>1</sup>Aichi Inst. of Tech., <sup>2</sup>Honda Electronics, <sup>3</sup>Univ. of Electro-Comm., <sup>4</sup>AIST)
- 11:30-12:30    Piezoelectric devices I, Measurement techniques I**  
**Chair: Hiroyuki Odagawa (National Inst. of Tech, Kumamoto Col.)**
- 1J2-1\***    **High Frequency Thickness Expansion Mode Bulk Acoustic Wave Resonator Using LN Single Crystal Thin Plate**  
○Kohei Matsumoto, Michio Kadota, Shuji Tanaka (Tohoku Univ.)
- 1J2-2\***    **Large electromechanical coupling and temperature characteristic of free-standing sputter-epitaxial PbTiO<sub>3</sub> plates**  
○Yuka Matsuda<sup>1,2</sup>, Takahiko Yanagitani<sup>1,2,3</sup> (<sup>1</sup>Waseda Univ., <sup>2</sup>ZAIKEN, <sup>3</sup>JST PRESTO)
- 1J2-3\***    **Estimation of position and velocity for a moving large target with specular surface using simultaneous transmission of M-sequence ultrasound signals**  
○Shogo Nonaka, Shinnosuke Hirata, Hiroyuki Hachiya (Tokyo Tech.)
- 1J2-4**    **Vibration structure and radiation waves of active fault**  
○Toshiaki Kikuchi<sup>1</sup>, Koichi Mizutani<sup>2</sup> (<sup>1</sup>Natl. Defense Academy, <sup>2</sup>Univ. of Tsukuba)
- 12:30-14:00    LUNCH TIME**
- 14:00-14:40    40th Anniversary Special Talk**                      **Chair: Hiroshi Kanai (Tohoku Univ.)**
- 1PL**    **Memoir of my walk along with the progress of USE (Symposium on Ultrasonic Electronics)**  
○Yoshiaki Watanabe (Doshisya Univ.)

15:00-17:00 Poster Session

Chair: Makiko Kobayashi (Kumamoto Univ.)

- 1P1-1\* **Analysis of Elastic Vortex Wave for Optical Orbital Angular Momentum Mode Conversion in Ring Core Optical Fiber**  
○Takuya Shoro, Hiroki Kishikawa, Nobuo Goto (Tokushima Univ.)
- 1P1-2 **High-power properties of (Sr,Ca)<sub>2</sub>NaNb<sub>5</sub>O<sub>15</sub> piezoelectric ceramics in a longitudinal mode**  
○Yutaka Doshida<sup>1</sup>, Hideki Tamura<sup>2</sup>, Satoshi Tanaka<sup>3</sup>, Tomohiro Harada<sup>4</sup>, Hiroyuki Shimizu<sup>4</sup>  
(<sup>1</sup>Ashikaga Univ., <sup>2</sup>Tohoku Inst. of Tech., <sup>3</sup>Nagaoka Univ. of Tech., <sup>4</sup>Taiyo Yuden Co., Ltd.)
- 1P1-3\* **High-pressure elasticity of Baltic amber studied by Brillouin spectroscopy**  
○Kyoung Hun Oh<sup>1</sup>, Young-Ho Ko<sup>1</sup>, Jae-Hyeon Ko<sup>2</sup>, Seiji Kojima<sup>3</sup>  
(<sup>1</sup>Agency for Defense Dev., <sup>2</sup>Hallym Univ., <sup>3</sup>Univ. of Tsukuba)
- 1P1-4\* **Acoustic wave propagation at a 3-layered graphene/LiNbO<sub>3</sub> interface**  
○Shohei Yoshimura<sup>1</sup>, Daichi Eto<sup>1</sup>, B. Onwona-Agyeman<sup>2</sup>, Yong Sun<sup>1</sup> (<sup>1</sup>Kyushu Inst. of Tech., <sup>2</sup>Univ. of Ghana)
- 1P1-5\* **Fabrication of CaBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub>/Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub> ultrasonic transducers by automatic spray method**  
○Ayako Inano, Shohei Nozawa, Takumi Hara, Kei Nakatsuma, Makiko Kobayashi (Kumamoto Univ.)
- 1P1-6\* **High Temperature Performance at 700°C of LiNbO<sub>3</sub>/Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub> Ultrasonic Transducer Composite**  
○Daichi Maeda, Minoru Furukawa, Shohei Nozawa, Makiko Kobayashi (Kumamoto Univ.)
- 1P1-7\* **Low Temperature Fabrication of Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub>/Al<sub>2</sub>O<sub>3</sub> Sol-Gel Composite Ultrasonic Transducer**  
○Kazuki Okada, Shohei Nozawa, Kei Nakatsuma, Makiko Kobayashi (Kumamoto Univ.)
- 1P1-8\* **Analysis and Estimation of Thermal Conductivity of Si Nanopillar/SiGe Composite Film by Using Photo-Thermal Spectroscopy Measurement with a Multi-layer Model Calculation**  
○Tomoki Harada<sup>1</sup>, Tsubasa Aki<sup>1</sup>, Daisuke Ohori<sup>2</sup>, Seiji Samukawa<sup>2</sup>, Tetsuo Ikari<sup>1</sup>, Atsuhiko Fukuyama<sup>1</sup>  
(<sup>1</sup>Univ. of Miyazaki, <sup>2</sup>Tohoku Univ.)
- 1P2-1 **Source-State-Controlled Equivalent Circuit for Electromechanical Transducer**  
○Michio Ohki (Natl. Defense Academy)
- 1P2-2\* **Development of laminated lithium niobate transducer available at 500°C**  
○Satoru Abe, Toshihiro Tsuji, Yoshikazu Ohara, Tsuyoshi Mihara (Tohoku Univ.)
- 1P2-3\* **Development of couplant-free point-contact ultrasonic probe for concrete measurement**  
○Tatsuya Suzuki, Toshihiro Tsuji, Yoshikazu Ohara, Tsuyoshi Mihara (Tohoku Univ.)
- 1P2-4 **Investigation on Arrangement of Sound Source Elements to Improve Results of Reflection Point Search by Rectangular Sound Source**  
○Hiroyuki Masuyama (NIT, Toba College)
- 1P2-5\* **Focus and frequency evaluation of acoustic lens type focused ultrasonic probe**  
○Yuusuke Tanaka, Akira Abe, Yukio Ogura (Japan Probe Co., Ltd.)
- 1P2-6 **Basic study on intraocular pressure measurement using acoustic radiation pressure**  
○Margarette Kozuka, Motoaki Sano (Toin Univ. of Yokohama)
- 1P2-7 **Anisotropy Measurement of Shear Wave Propagation by External Excitation**  
○Ren Koda, Yoshiki Yamakoshi (Gunma Univ.)
- 1P2-8\* **Comparison of contact/non-contact measurement of speed of sound for a tissue-mimicking phantom with inclined sides**  
○Toshiaki Okubo, Shinnosuke Hirata, Hiroyuki Hachiya (Tokyo Tech.)
- 1P2-9\* **Position and angle detection system using photo-acoustic transmitter for catheter devices**  
○Ryo Imai, Tomohiko Tanaka (Hitachi, Ltd.)
- 1P2-10 **Application of spatial spectral entropy on composite materials for noncontact acoustic inspection**  
○Kazuko Sugimoto<sup>1</sup>, Tsuneyoshi Sugimoto<sup>1</sup>, Noriyuki Utagawa<sup>2</sup>, Chitose Kuroda<sup>2</sup>  
(<sup>1</sup>Toin Univ. of Yokohama, <sup>2</sup>Sato Kogyo Co., Ltd.)
- 1P2-11 **Measurement of heat flow from ultrasonic transducer to ultrasonic phantom**  
○Takeyoshi Uchida, Masahiro Yoshioka, Ryuzo Horiuchi (AIST)

- 1P2-12\*** Precise ultrasonic distance measurement of moving object by using single Linear-Period-Modulated signal independent of Doppler velocity estimation  
○Haruki Chiba, Minoru Kuribayashi Kurosawa (Tokyo Tech.)
- 1P2-13\*** Viscoelasticity measurement for living tissue using airborne ultrasonic Doppler method  
○Ryota Sando, Shinnosuke Hirata, Marie Tabaru (Tokyo Tech.)
- 1P2-14** Fourier Beamforming with no approximate processing for virtual source  
○Chikayoshi Sumi, Naoto Yamazaki (Sophia Univ.)
- 1P2-15\*** Separation and Detection of Odorous Compounds at Parts-Per-Billion by Volume Levels Using Ball SAW Gas Chromatograph  
○Takamitsu Iwaya<sup>1</sup>, Singo Akao<sup>1</sup>, Nobuo Takeda<sup>1</sup>, Toshihiro Tsuji<sup>2,1</sup>, Toru Oizumi<sup>1</sup>, Hideyuki Fukushi<sup>1</sup>, Tatsuhiko Okano<sup>1</sup>, Maki Sugawara<sup>1</sup>, Yusuke Tsukahara<sup>1</sup>, Kazushi Yamanaka<sup>1,2</sup> (<sup>1</sup>Ball Wave Inc., <sup>2</sup>Tohoku Univ.)
- 1P3-1** Low Velocity I.H.P. SAW using Heavy Electrodes for Downsizing  
○Ryo Nakagawa, Hideki Iwamoto, Tsutomu Takai (Murata Mfg.)
- 1P3-2\*** Spurious Mode Suppression in I.H.P. SAW Resonator using High Velocity Film on Glass Substrate  
○Sho Nagatomo, Hideki Iwamoto, Yasumasa Taniguchi (Murata Mfg.)
- 1P3-3** Spurious-free and steep band rejection filter using LiTaO<sub>3</sub>/quartz HAL SAW resonator  
○Michio Kadota, Yoshimi Ishii, Shuji Tanaka (Tohoku Univ.)
- 1P3-4\*** Analysis of Leaky Surface Acoustic Waves on Similar-Material Bonded Structure  
○Takumi Fujimaki, Masashi Suzuki, Shoji Kakio (Univ. of Yamanashi)
- 1P3-5** Propagation Properties of Leaky SAW on Water-loaded LiTaO<sub>3</sub>/Quartz Bonded Structure  
○Shoji Kakio<sup>1</sup>, Yoshiki Kato<sup>1</sup>, Ryota Suenaga<sup>1</sup>, Masashi Suzuki<sup>1</sup>, Ami Tezuka<sup>2</sup>, Hiroyuki Kuwae<sup>2</sup>, Hiroaki Yokota<sup>3</sup>, Toshifumi Yonai<sup>3</sup>, Kazuhito Kishida<sup>3</sup>, Jun Mizuno<sup>2</sup> (<sup>1</sup>Univ. of Yamanashi, <sup>2</sup>Waseda Univ., <sup>3</sup>The Japan Steel Works, Ltd.)
- 1P3-6** Theoretical Analysis of Leaky SAW Propagation Characteristics on ScAlN film/Quartz  
○Masashi Suzuki, Shoji Kakio (Univ. of Yamanashi)
- 1P3-7\*** Analysis of guided mode in TC-SAW device by using multi-mode COM model  
○Gongbin Tang, Rei Goto, Hiroyuki Nakamura (Skyworks Solutions, Inc.)
- 1P3-8\*** Study of Excess Loss Mechanism in TC-SAW Devices Based on FEM Simulation Using Hierarchical Cascading Technique  
○Naoto Matsuoka<sup>1,2</sup>, Xinyi Li<sup>3,2</sup>, Tatsuya Omori<sup>2</sup>, Ken-ya Hashimoto<sup>2</sup> (<sup>1</sup>Nihon Dempa Kogyo, <sup>2</sup>Chiba Univ., <sup>3</sup>Univ. of Electric Sci. and Tech.)
- 1P3-9** Study on dominant 2<sup>nd</sup> order nonlinear mechanism in AlN FBAR  
○Taisei Irieda<sup>1</sup>, Tokihiro Nishihara<sup>1</sup>, Masanori Ueda<sup>1</sup>, Ken-ya Hashimoto<sup>2</sup> (<sup>1</sup>Taiyo Yuden Co., Ltd., <sup>2</sup>Chiba Univ.)
- 1P3-10\*** Mechanism of Enlarged Nonlinear H<sub>2</sub> Response of Transverse Modes in RF BAW Devices  
○Luyan Qiu<sup>1</sup>, Xinyi Li<sup>2,1</sup>, Tatsuya Omori<sup>1</sup>, Ken-ya Hashimoto<sup>1</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>Univ. of Electric Sci. and Tech.)
- 1P4-1** On the variations in the size distribution of bulk nanobubbles in response to static pressure increment  
○Toru Tuziuti, Kyuichi Yasui, Wataru Kanematsu (AIST)
- 1P4-2** Analysis of vortex caused by multiple acoustic streaming  
○Jungsoon Kim<sup>1</sup>, Jihee Jung<sup>2</sup>, Moojoon Kim<sup>3</sup> (<sup>1</sup>Tongmyong Univ., <sup>2</sup>GU Ltd., <sup>3</sup>Pukyong Nat'l Univ.)
- 1P4-3** A cylindrical waveguide with different diameters for extracting high-intensity pressure pulse of underwater spark-induced shock wave and for suppressing the impact of cavitation  
○Koji Aizawa, Takumi Kobayashi (Kanazawa Inst. Tech.)
- 1P4-4** Coupling effect between sonolysis and photocatalysis in dilute reactant solution  
Kiyooki Shinashi<sup>1</sup>, Hisashi Tanaka<sup>2</sup>, ○Hisashi Harada<sup>2</sup> (<sup>1</sup>Chuo Gakuin Univ., <sup>2</sup>Meisei Univ.)
- 1P4-5** Sonochemiluminescence using focused ultrasounds at 1 MHz  
○Pak-Kon Choi<sup>1</sup>, Koichi Kano<sup>1</sup>, Hyang-Bok Lee<sup>2</sup>, Moojoon Kim<sup>3</sup>, Jungsoon Kim<sup>4</sup> (<sup>1</sup>Meiji Univ., <sup>2</sup>Japan Women's Univ., <sup>3</sup>Pukyong Univ., <sup>4</sup>Tongmyon Univ.)

- 1P4-6\*** **Characteristics of particle size distribution of agglomerates in an ultrasonic source with a cylindrical rigid wall**  
 ○Rintaro Motoi, Takuya Asami, Hikaru Miura (Nihon Univ.)
- 1P4-7** **A prototype of a thermoacoustic prime mover of the full-length 29 m -Numerical calculation of system internal diameter and onset temperature-**  
 ○Shin-ichi Sakamoto, Kenshiro Inui, Yuichiro Orino, So Ueno (Univ. of Shiga Pref.)
- 1P4-8\*** **Control of surface profile of a vari-focal lens using ultrasound and a thixotropic gel**  
 ○Daiko Sakata, Daisuke Koyama, Mami Matsukawa (Doshisha Univ.)
- 1P4-9\*** **Generation of High-Intensity Pulsed Ultrasound by Airborne Ultrasound Phased Array**  
 ○Kiyosuke Shimizu, Ayumu Osumi, Youichi Ito (Nihon Univ.)
- 1P4-10** **Evaluation of high power property of (Bi,Na)TiO<sub>3</sub>-BaTiO<sub>3</sub> and its application for elastic fin type ultrasonic motor**  
 ○Susumu Miyake<sup>1</sup>, Tomohiro Harada<sup>2</sup>, Hiroyuki Shimizu<sup>2</sup>, Sumiaki Kishimoto<sup>2</sup>, Takeshi Morita<sup>1</sup>  
 (<sup>1</sup>The Univ. of Tokyo, <sup>2</sup>Taiyo Yuden Co., Ltd.)
- 1P4-11\*** **Experiment Evaluation of Switching Drive Method Linked-Twin-Square –USM for Servo-positioning Control**  
 ○Ryou Ishiguro, Hideki Tamura, Takehiro Takano (Tohoku Inst. of Tech.)
- 1P4-12\*** **Resonance control of coaxial thermoacoustic system by an additional stack -Examination using an identical thermal input-**  
 ○Riku Onishi<sup>1</sup>, Shin-ichi Sakamoto<sup>2</sup>, Kazuki Shiraki<sup>1</sup>, Daichi Kuroki<sup>1</sup>, Yoshiaki Watanabe<sup>1</sup>  
 (<sup>1</sup>Doshisha Univ., <sup>2</sup>Univ. of Shiga Pref.)
- 1P4-13\*** **Advancement of energy conversion in traveling-wave thermoacoustic-system by heating the center of a stack**  
 ○Yuto Kawashima<sup>1</sup>, Shin-ichi Sakamoto<sup>2</sup>, Daichi Kuroki<sup>1</sup>, Kazuki Shiraki<sup>1</sup>, Yuya Kurata<sup>1</sup>, Yoshiaki Watanabe<sup>1</sup>  
 (<sup>1</sup>Doshisha Univ., <sup>2</sup>Univ. of Shiga Pref.)
- 1P5-1\*** **Self-demodulation Characteristics of Amplitude-modulated Bone-conducted Ultrasound in the Human Body Presented to the Neck, Trunk and Arm**  
 ○Koichiro Doi<sup>1</sup>, Riki Ogino<sup>1</sup>, Sho Otsuka<sup>1,2</sup>, Seiji Nakagawa<sup>1,2</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>Chiba Univ. Hospital)
- 1P5-2\*** **Viscoelasticity estimation of radial artery by simultaneously measuring changes in pressure and diameter using single ultrasound probe**  
 ○Takumi Saito<sup>1</sup>, Shohei Mori<sup>1</sup>, Mototaka Arakawa<sup>1</sup>, Shigeo Ohba<sup>1</sup>, Kazuto Kobayashi<sup>2</sup>, Hiroshi Kanai<sup>1</sup>  
 (<sup>1</sup>Tohoku Univ., <sup>2</sup>Honda Electronics)
- 1P5-3** **Spatial coherence for multi-angle plane-wave DMAS beamforming in clinical ultrasonic imaging of carotid artery**  
 ○Che-Chou Shen, Pei-Ying Hsieh (NTUST)
- 1P5-4\*** **Accuracy evaluation of 3D velocity estimation by multi-frequency phase tracking method with matrix array probe**  
 ○Soichiro Nunome, Ryo Nagaoka, Hideyuki Hasegawa (Univ. of Toyama)
- 1P5-5** **Evaluation of Relationship between Liver Pathological Structure and Speed of Sound of Longitudinal Wave**  
 ○Takuya Ogawa, Kenji Yoshida, Takashi Ohnishi, Hideaki Haneishi, Tadashi Yamaguchi (Chiba Univ.)
- 1P5-6\*** **Longitudinal Wave Velocity and Crystal Orientation of HAp in Equine Cortical Bone**  
 ○Mineaki Takata<sup>1</sup>, Yoshinori Kasashima<sup>2</sup>, Norihisa Tamura<sup>2</sup>, Tsukasa Nakamura<sup>1</sup>, Tomoya Oda<sup>1</sup>, Mami Matsukawa<sup>1</sup>  
 (<sup>1</sup>Doshisha Univ., <sup>2</sup>JRA Equine Research Institute)
- 1P5-7\*** **In vivo Application of Fatty Liver Progression Assessment Method by Double Nakagami Model**  
 ○Yusuke Sato<sup>1</sup>, Kazuki Tamura<sup>2</sup>, Kenji Yoshida<sup>1</sup>, Tadashi Yamaguchi<sup>1</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>Hamamatsu Univ. School of Med.)
- 1P5-8** **Novel method of lipid content quantification using double-Nakagami distribution model in rat liver steatosis**  
 ○Kazuki Tamura<sup>1</sup>, Jonathan Mamou<sup>2</sup>, Kenji Yoshida<sup>3</sup>, Hiroyuki Hachiya<sup>4</sup>, Tadashi Yamaguchi<sup>3</sup>  
 (<sup>1</sup>Hamamatsu Univ. School of Med., <sup>2</sup>Riverside Research, <sup>3</sup>Chiba Univ., <sup>4</sup>Tokyo Tech.)

- 1P5-9\*** Quantitative evaluation of liver fibrosis using optimal input parameters for multi-Rayleigh model with two components  
○Chuang Zhang, Shinnosuke Hirata, Hiroyuki Hachiya (Tokyo Tech.)
- 1P5-10\*** Development of Backscatter Coefficient Evaluation Method on Conventional Ultrasound Scanner – Comparison with Single-Element Transducer  
○Takuma Oguri<sup>1,2</sup>, Masaaki Omura<sup>2</sup>, Takeru Mizoguchi<sup>2</sup>, Kazuya Ito<sup>2</sup>, Atsuko Yamada<sup>2</sup>, Tadashi Yamaguchi<sup>2</sup> (<sup>1</sup>GE Healthcare, <sup>2</sup>Chiba Univ.)
- 1P5-11\*** Comprehensive scattering characteristics analysis of soft tissues with a high-frequency annular array  
○Takeru Mizoguchi<sup>1</sup>, Kenji Yoshida<sup>1</sup>, Jonathan Mamou<sup>2</sup>, Jeffrey A. Ketterling<sup>2</sup>, Tadashi Yamaguchi<sup>1</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>Riverside Research)
- 1P5-12\*** Comparison of Different Sound Field Correction Methods on Backscatter Coefficient Analysis  
○Kazuya Ito<sup>1</sup>, Masaaki Omura<sup>1</sup>, Takuma Oguri<sup>2,1</sup>, Takeru Mizoguchi<sup>1</sup>, Atsuko Yamada<sup>1</sup>, Kenji Yoshida<sup>1</sup>, Tadashi Yamaguchi<sup>1</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>GE Healthcare)
- 1P5-13** Theoretical Verification on Changes in Ultrasonic Peak Frequency during Measurement of Red Blood Cell Aggregation Degree  
○Takayuki Sato, Keisuke Nabuchi (Tokyo Metropolitan Univ.)
- 1P5-14\*** Displacement Distribution Measured by Directional Acoustic Field Generated by Dual Ultrasound Excitation to Estimate Viscoelasticity of Muscle Tissues  
○Hibiki Kawamura, Shohei Mori, Mototaka Arakawa, Hiroshi Kanai (Tohoku Univ.)
- 1P5-15\*** Study on speckle reduction of medical ultrasound images using deep learning with fully convolutional network  
○Kazuma Ando, Ryo Nagaoka, Hideyuki Hasegawa (Univ. of Toyama)
- 1P5-16\*** Examination of effectiveness of signal-to-noise ratio factor in estimation of sound speed of medium  
○Fumitada Sannou, Ryo Nagaoka, Hideyuki Hasegawa (Univ. of Toyama)
- 1P6-1** Preliminary Results of Refractive Index Measurements for Some Materials of Convex Acoustic Lens Applying to Ambient Noise Imaging  
○Kazuyoshi Mori, Hanako Ogasawara (Natl. Defense Academy)
- 1P6-2** Design of Wide Angle Compound Eye Underwater Acoustic Lens  
○Yuji Sato, Tadashi Ebihara, Koichi Mizutani, Naoto Wakatsuki (Univ. of Tsukuba)
- 1P6-3** A Study of Acoustic Properties of Surface Seabed Sediment at the Ariake Sea  
○Hanako Ogasawara, Masato Yoshiguchi, Kazuyoshi Mori (Natl. Defense Academy)
- 17:10-17:55** Physical acoustics I **Chair: Hirotsugu Ogi (Osaka Univ.)**
- 1J3-1\*** Multivariate Curve Resolution for Angle-resolved polarized Raman Spectroscopy of Ferroelectrics  
○Shinya Tsukada<sup>1</sup>, Yasuhiro Fujii<sup>2</sup> (<sup>1</sup>Shimane Univ., <sup>2</sup>Ritsumeikan Univ.)
- 1J3-2\*** Effect of Insertion of the Strain Relaxation Layer on the Carrier Transport Properties of InGaAs/GaAsP Superlattice Solar Cells Investigated by the Photo-Thermal Spectroscopy  
○Airi Watanabe<sup>1</sup>, Tsubasa Nakamura<sup>1</sup>, Ryohei Iwanaga<sup>1</sup>, Masakazu Sugiyama<sup>2</sup>, Tetsuo Ikari<sup>1</sup>, Atsuhiko Fukuyama<sup>1</sup> (<sup>1</sup>Univ. of Miyazaki, <sup>2</sup>The Univ. of Tokyo)
- 1J3-3** Symmetric and asymmetric spectra of acoustic waves resonantly transmitted through a slab in a fluid  
○Seiji Mizuno (Hokkaido Univ.)

**18:00** Organizing Committee Meeting

**Tuesday, November 26**

**9:00-10:15** Physical acoustics II, Measurement techniques II  
**Chair: Oliver Wright (Hokkaido Univ.)**

- 2E1-1\* Phonon propagation in isotope diamond thin films studied by pump-probe laser reflectivity measurement**  
 ○Hsu Kai Weng<sup>1</sup>, Akira Nagakubo<sup>1</sup>, Hideyuki Watanabe<sup>2</sup>, Hirotsugu Ogi<sup>1</sup> (<sup>1</sup>Osaka Univ., <sup>2</sup>AIST)
- 2E1-2 Acoustic phonon anomalies in Ca doped SrTiO<sub>3</sub> quantum ferroelectrics as studied by Brillouin Scattering**  
 ○Venkatasubramanian Sivasubramanian<sup>1</sup>, Seiji Kojima<sup>2</sup> (<sup>1</sup>Indira Gandhi Centre for Atomic Research, <sup>2</sup>Univ. of Tsukuba)
- 2E1-3 Development of confocal picosecond ultrasonics**  
 ○Nobutomo Nakamura, Atsushi Maehara, Hirotsugu Ogi (Osaka Univ.)
- 2E1-4 Efficiency improvement of outer wall inspection using acoustic irradiation induced vibration from UAV**  
 ○Tsuneyoshi Sugimoto<sup>1</sup>, Kazuko Sugimoto<sup>1</sup>, Itsuki Uechi<sup>1</sup>, Noriyuki Utagawa<sup>2</sup>, Chitose Kuroda<sup>2</sup>  
 (<sup>1</sup>Toin Univ. of Yokohama, <sup>2</sup>Sato Kogyo Co., Ltd.)
- 2E1-5 Adhesive free PVDF copolymer focused transducers for high frequency acoustic imaging**  
 ○Anowarul Habib<sup>1</sup>, Sanat Wagle<sup>2</sup>, Frank Melandsø<sup>1</sup> (<sup>1</sup>UiT The Arctic Univ. of Norway, <sup>2</sup>Elop AS)
- 10:15-11:30 Piezoelectric devices II, High power ultrasound II, Ocean acoustics I**  
**Chair: Jun Kondoh (Shizuoka Univ.)**
- 2E2-1 Injection-Lock-Type BAW Oscillator Aiming for Self-Oscillating Atomic Clock**  
 ○Motoaki Hara<sup>1</sup>, Yuichiro Yano<sup>1</sup>, Masatoshi Kajita<sup>1</sup>, Shinsuke Hara<sup>1</sup>, Akifumi Kasamatsu<sup>1</sup>, Hiroyuki Ito<sup>2</sup>, Tetsuya Ido<sup>1</sup>  
 (<sup>1</sup>Natl. Inst. of Information and Communications Tech., <sup>2</sup>Tokyo Tech.)
- 2E2-2 Surface analysis of SH-SAW immunosensors using displacement penetration effect into specimens**  
 ○Koji Kano<sup>1,2</sup>, Hiromi Yatsuda<sup>2</sup>, Jun Kondoh<sup>1</sup> (<sup>1</sup>Shizuoka Univ., <sup>2</sup>Japan Radio Co., Ltd.)
- 2E2-3\* Double-parabolic-reflectors acoustic waveguides (DPLUS) for minimally invasive treatments**  
 ○Kang Chen<sup>1</sup>, Takasuke Irie<sup>2</sup>, Takashi Iijima<sup>3</sup>, Takeshi Morita<sup>1</sup> (<sup>1</sup>The Univ. of Tokyo, <sup>2</sup>Microsonic Co, Ltd., <sup>3</sup>AIST)
- 2E2-4 Ultrasound homogenises suspensions of hydrophobic particles**  
 ○Michiel Postema<sup>1</sup>, Ryonosuke Matsumoto<sup>2</sup>, Ri-ichiro Shimizu<sup>2</sup>, Albert T. Poortinga<sup>3</sup>, Nobuki Kudo<sup>2</sup>  
 (<sup>1</sup>Univ. Witwatersrand, <sup>2</sup>Hokkaido Univ., <sup>3</sup>Eindhoven Univ. Technol.)
- 2E2-5 Correlation Analysis of Fading Variation and Communication Performance according to Depth in Underwater Frequency Selective Channel**  
 ○Jihyun Park, Hyunsoo Jeong, Kyu-Chil Park (Pukyong National Univ.)
- 11:30-13:00 LUNCH TIME**
- 13:00-13:50 Plenary Talk (Cosponsored by IEEE Ultrasonics, Ferroelectrics and Frequency Control Society Japan Chapter)**  
**Chair: Kentaro Nakamura (Tokyo Tech.)**
- 2PL Ultrasound for preclinical research: "Shear wave imaging and photoacoustic imaging of small animals and 3D cell culture systems"**  
 ○Pai-Chi Li (National Taiwan Univ.)
- 14:00-16:00 Poster Session** **Chair: Tsuyoshi Mihara (Tohoku Univ.)**
- 2P1-1 Fluidity measurement of gel-like microparticle dispersion by EMS system for assessing mechanical properties of dispersed particle**  
 ○Taichi Hirano, Shujiro Mitani, Keiji Sakai (The Univ. of Tokyo)
- 2P1-2 Interfacial elastic waves in the interface between tunable two-dimensional phononic crystals composed of magneto-elastic materials**  
 ○Yukihiro Tanaka, Shuna Nagai (Hokkaido Univ.)
- 2P1-3\* Development of Multiphoton Excitation Thermal Lens Spectroscopy for Label-Free and High-Sensitive Detection**  
 ○Shinjuro Kohirata, Miki Isoda, Akira Harata (Kyushu Univ.)

- 2P1-4 Topologically robust sound wave transport using phononic crystal in water**  
○Kenshi Okuno, Kenji Tsuruta (Okayama Univ.)
- 2P1-5 Design of Non-circular Membranes Metasurfaces for Broadband Sound Absorption**  
○Keita Watanabe, Mikiya Fujita, Kenji Tsuruta (Okayama Univ.)
- 2P1-6\* Piezoelectric Characteristics of c-Axis Oriented CrAlN Films Grown by RF Magnetron Sputtering**  
○Yusei Takano, Ryusei Hayakawa, Masashi Suzuki, Shoji Kakio (Univ. of Yamanashi)
- 2P1-7\* Measurement of Longitudinal Wave Velocity in Newly Formed and Mature Bone in the GHz Range**  
○Hirokazu Yasui<sup>1</sup>, Keita Yano<sup>1</sup>, Manon Fraulob<sup>2</sup>, Guillaume Haïat<sup>2</sup>, Mami Matsukawa<sup>1</sup> (<sup>1</sup>Doshisha Univ., <sup>2</sup>CNRS)
- 2P1-8 Continuous in-line measurement of viscosity by self-balancing EMS technique**  
○Maiko Hosoda<sup>1</sup>, Yoshikazu Yamakawa<sup>2</sup>, Keiji Sakai<sup>3</sup> (<sup>1</sup>Toko Denki Univ., <sup>2</sup>Triple-Eye Co. Ltd., <sup>3</sup>The Univ. of Tokyo)
- 2P2-1 Porosity Analysis of Porous Copper Films using Scanning Acoustic Microscopy and 3D SEM/FIB Tomography**  
Thomas Planko<sup>1</sup>, Andi Wijaya<sup>1</sup>, Barbara Eichinger<sup>2</sup>, Martin Mischitz<sup>2</sup>, ○Roland Brunner<sup>1</sup>  
(<sup>1</sup>Materials Center Leoben Forschung GmbH, <sup>2</sup>Infineon Technologies Austria AG)
- 2P2-2 Moving sound source for FDTD method**  
○Takao Tsuchiya<sup>1,2</sup>, Masashi Kanamori<sup>2</sup>, Takashi Takahashi<sup>2</sup> (<sup>1</sup>Doshisha Univ., <sup>2</sup>JAXA)
- 2P2-3 High-order FDTD Method for Room Acoustic Simulation**  
○Tan Yiyu, Toshiyuki Imamura (R-CCS)
- 2P2-4 Phantom made of polyvinyl alcohol for visualization of thermal distribution due to ultrasound**  
○Moojoon Kim<sup>1</sup>, Jungsoon Kim<sup>2</sup>, Pak-Kon Choi<sup>3</sup>, Hyang-Bok Lee<sup>4</sup>  
(<sup>1</sup>Pukyong Nat'l Univ., <sup>2</sup>Tongmyong Univ., <sup>3</sup>Meiji Univ., <sup>4</sup>Japan Women's Univ.)
- 2P2-5 Subsurface defect damage imaging in PZT ceramics using dual point contact excitation and detection**  
○H. Mahawar<sup>1</sup>, K. Agarwal<sup>2</sup>, D. K. Prasad<sup>2</sup>, F. Melandsø<sup>2</sup>, A. Habib<sup>2</sup>  
(<sup>1</sup>Indian Inst. of Tech., <sup>2</sup>UiT The Arctic Univ. of Norway)
- 2P2-6\* Effects of Soft-tissue Layer on Shear Wave Velocity Measurements in Cortical Bone Tubes**  
○Leslie Bustamante, Masaya Saeki, Mami Matsukawa (Doshisha Univ.)
- 2P2-7 Ultrasonic Evaluation of Indonesian Mango Fruits: an Initial Study**  
○Nurmalia (Prasetya Mulya Univ.)
- 2P2-8\* The Acoustic Impedance Interpretation of Human Skin Structure by Using Time and Frequency Domain Deconvolution**  
○Edo Bagus Prastika<sup>1</sup>, Atsushi Imori<sup>1</sup>, Tomohiro Kawashima<sup>1</sup>, Yoshinobu Murakami<sup>1</sup>, Sachiko Yoshida<sup>1</sup>, Naohiro Hozumi<sup>1</sup>, Ryo Nagaoka<sup>2</sup>, Kazuto Kobayashi<sup>3</sup>  
(<sup>1</sup>Toyohashi Univ. of Tech., <sup>2</sup>Univ. of Toyama, <sup>3</sup>Honda Electronics)
- 2P2-9 Investigation of Guided Wave in Flat Plate Generated by High-intensity Line Focus Aerial Ultrasonic Wave**  
○Ayumu Osumi, Wataru Sakuma, Youichi Ito (Nihon Univ.)
- 2P2-10 Imaging of three-dimensional crack open/closed distribution by nonlinear ultrasonic phased array based on fundamental wave amplitude difference**  
○Yoshikazu Ohara<sup>1</sup>, Hiromichi Nakajima<sup>1</sup>, Sylvain Hauptert<sup>2</sup>, Toshihiro Tsuji<sup>1</sup>, Tsuyoshi Mihara<sup>1</sup>  
(<sup>1</sup>Tohoku Univ., <sup>2</sup>Sorbonne Univ.)
- 2P2-11\* Target detection using airborne ultrasound alternately modulated by different M-sequence codes for extension of measurable distance**  
○Khanistha Leetang, Shinnosuke Hirata, Hiroyuki Hachiya (Tokyo Tech.)
- 2P2-12\* A study on ultrasonic liquid flow measurement using non-invasive single-sided array transducer**  
○Thi Huong Ly Nguyen<sup>1</sup>, Jae-Hyun Park<sup>2,3</sup>, Suhyun Park<sup>1</sup> (<sup>1</sup>Chung-Ang Univ., <sup>2</sup>Ajou Univ., <sup>3</sup>Flos Korea)
- 2P2-13\* Enhancement of sensitivity of Pd-based hydrogen sensor by repeated hydrogen flow confirmed by wireless QCM**  
○Lianjie Zhou, Nobutomo Nakamura, Akira Nagakubo, Hirotsugu Ogi (Osaka Univ.)

- 2P2-14 Lifetime measurement of cavitation cloud bubbles using long exposure shadowgraphy**  
 ○Gwansuk Kang<sup>1</sup>, Yukio Tomita<sup>2</sup>, Sung Chan Cho<sup>3</sup>, Jung Sik Hur<sup>4</sup>, Joo Ha Hwang<sup>1</sup>, Min Joo Choi<sup>4</sup>  
 (<sup>1</sup>Stanford Univ., <sup>2</sup>Hokkaido Univ. of Education, <sup>3</sup>KORUST, <sup>4</sup>Jeju National Univ.)
- 2P2-15 Applying the Internet of things and quartz crystal microbalance oscillators to quality factor measurement**  
 ○Yasuaki Watanabe, Yuuki Okamoto, Jing Wang, Takayuki Sato (Tokyo Metropolitan Univ.)
- 2P3-1\* Ion beam induced a-axis in-plane oriented (0001) ScAlN thin film**  
 ○Chiaki Masamune<sup>1,2</sup>, Takahiko Yanagitani<sup>1,2,3</sup> (<sup>1</sup>Waseda Univ., <sup>2</sup>ZAIKEN, <sup>3</sup>JST PRESTO)
- 2P3-2\* Design of double layered thickness-shear resonator using Langasite-type piezoelectric single crystal -Selection of optimal substrate orientation-**  
 ○Yusuke Owada<sup>1</sup>, Yuji Ohashi<sup>1,2</sup>, Masaya Omote<sup>2</sup>, Yuui Yokota<sup>1</sup>, Shunsuke Kurosawa<sup>1</sup>, Kei Kamada<sup>1</sup>, Hiroki Sato<sup>1</sup>, Satoshi Toyoda<sup>1</sup>, Masao Yoshino<sup>1</sup>, Akihiro Yamaji<sup>1</sup>, Akira Yoshikawa<sup>1</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>XMAT)
- 2P3-3\* Poling of Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub>/Pb(Zr,Ti)O<sub>3</sub> by negative corona discharge**  
 ○Takumi Hara, Shohei Nozawa, Kei Nakatsuma, Makiko Kobayashi (Kumamoto Univ.)
- 2P3-4\* Poling of Pb(Zr,Ti)O<sub>3</sub>/Pb(Zr,Ti)O<sub>3</sub> by negative corona discharge**  
 ○Minori Furukawa, Shohei Nozawa, Takumi Hara, Kei Nakatsuma, Makiko Kobayashi (Kumamoto Univ.)
- 2P3-5\* Poling degree Control of Pb(Zr,Ti)O<sub>3</sub>/Pb(Zr,Ti)O<sub>3</sub>**  
 ○Hirotō Makino, Kei Nakatsuma, Takumi Hara, Makiko Kobayashi (Kumamoto Univ.)
- 2P3-6\* Pb(Zr, Ti)O<sub>3</sub>/Pb(Zr, Ti)O<sub>3</sub> Poling by pulse voltage**  
 ○Makie Hidaka, Minori Furukawa, Makiko Kobayashi (Kumamoto Univ.)
- 2P3-7\* Effect of TiO<sub>2</sub> Sol-Gel Phase on Ultrasonic Properties**  
 ○Shohei Nozawa, Minori Furukawa, Makiko Kobayashi (Kumamoto Univ.)
- 2P3-8 Simplification of Structure of Frequency-Change-Type Three-Axis Acceleration Sensor**  
 ○Sumio Sugawara, Subaru Kudo (Ishinomaki Senshu Univ.)
- 2P3-9 Finite element analysis of the complex bar resonator with longitudinal-torsional vibration converter**  
 ○Subaru Kudo, Yoshifumi Sasaki, Sumio Sugawara (Ishinomaki Senshu Univ.)
- 2P4-1\* Effect of flow rate on washing rate for ultrasonic washing with running water**  
 ○Hidenobu Hosaka, Takuya Asami, Hikaru Miura (Nihon Univ.)
- 2P4-2\* Highly sensitive detection of amyloid-β seed by ultrasonic irradiation**  
 ○Ryota Matsuda, Yasushi Oshikane, Kentarou Noi, Masatomo So, Yuji Goto, Hirotōsugu Ogi (Osaka Univ.)
- 2P4-3 Enhancement of desorption amount of carbon dioxide gas from monoethanolamine solution using ultrasound and calcium chloride**  
 ○Yuya Kitamura, Hirokazu Okawa, Takahiro Kato, Katsuyasu Sugawara (Akita Univ.)
- 2P4-4\* Removal of arsenite from aqueous solutions using ultrasonic irradiation in the presence of a lead electrode**  
 ○Miyaki Ohta, Hirokazu Okawa, Takahiro Kato, Katsuyasu Sugawara (Akita Univ.)
- 2P4-5 Effect of Frequency on Ultrasonic Degassing**  
 ○Yoshiyuki Asakura<sup>1</sup>, Keiji Yasuda<sup>2</sup> (<sup>1</sup>Honda Electronics, <sup>2</sup>Nagoya Univ.)
- 2P4-6 Effect of Ultrafine Bubbles on Ethanol Enrichment from Aqueous Solution by Ultrasonic Atomization**  
 ○Keiji Yasuda<sup>1</sup>, Yumi Nohara<sup>1</sup>, Yoshiyuki Asakura<sup>2</sup> (<sup>1</sup>Nagoya Univ., <sup>2</sup>Honda Electronics)
- 2P4-7 Piezoelectric Linear Motor with Ultrasound Domain Tuning Fork Resonance Structure**  
 ○Chaodong Li, Cong Xi (Shanghai Univ.)
- 2P4-8\* Study on spherical shell-like stator for weight reduction of spherical ultrasonic motor**  
 ○Kento Goda, Manabu Aoyagi (Muroran Inst. of Tech.)
- 2P4-9\* Resonance characteristics of a longitudinal-torsional complex vibration source using a transmission rod with helical slits**  
 ○Shinya Oishi, Takuya Asami, Hikaru Miura (Nihon Univ.)



- 2P4-10\*** Resonance mode control by superposition of external sound waves in standing-wave thermoacoustic system -Relationship between viscous boundary layer and resonance mode-  
 ○Yuya Kurata<sup>1</sup>, Shin-ichi Sakamoto<sup>2</sup>, Kazuki Shiraki<sup>1</sup>, Koto Hiramatsu<sup>1</sup>, Yuto Kawashima<sup>1</sup>, Yoshiaki Watanabe<sup>1</sup>  
 (<sup>1</sup>Doshisha Univ., <sup>2</sup>Univ. of Shiga Pref.)
- 2P4-11\*** Experimental study of the thermal buffer tube temperature gradient and onset temperature in a loop-tube-type thermoacoustic system  
 ○Hidekazu Katsuki, Shin-ichi Sakamoto (Univ. of Shiga Pref.)
- 2P4-12\*** Measurement of temperature distribution with 3D-printer and etching meshes stack in thermoacoustic heat pump  
 ○Shintaro Kataoka, Shin-ichi Sakamoto (Univ. of Shiga Pref.)
- 2P5-1\*** Study on method for estimating focal pressure by detecting variation in speed of sound  
 ○Yutaro Tsujimoto, Kazuya Shimizu, Takashi Azuma, Shu Takagi (The Univ. of Tokyo)
- 2P5-2** Effect of phase frequency response of hydrophone sensitivity on instantaneous acoustic pressure of diagnostic ultrasound  
 ○Yusuke Chiba<sup>1</sup>, Masahiro Yoshioka<sup>1</sup>, Ryuzo Horiuchi<sup>1</sup>, Shin-ichiro Umemura<sup>1,2</sup> (<sup>1</sup>AIST, <sup>2</sup>Tohoku Univ.)
- 2P5-3** Vibration characteristic analysis according to thickness of support layer of diaphragm type PZT resonator  
 ○Masatoshi Suzuki<sup>1</sup>, Norio Tagawa<sup>1</sup>, Masasumi Yoshizawa<sup>2</sup>, Takasuke Irie<sup>3,1</sup>  
 (<sup>1</sup>Tokyo Metropolitan Univ., <sup>2</sup>Tokyo Met. Coll. of Industrial Tech., <sup>3</sup>Microsonic Co, Ltd.)
- 2P5-4** Improvement of Vibration Characteristics of Vibrator for Microinjection  
 ○Toshihiro Koya<sup>1</sup>, Jun Hasegawa<sup>1</sup>, Fujio Miyawaki<sup>2</sup> (<sup>1</sup>Takushoku Univ., <sup>2</sup>Toko Denki Univ.)
- 2P5-5\*** Propagation and perception characteristics of distantly-presented bone-conducted sounds - Comparison between ultrasonic and low-frequency ranges-  
 ○Riki Ogino<sup>1</sup>, Koichiro Doi<sup>1</sup>, Sho Otsuka<sup>1,2</sup>, Seiji Nakagawa<sup>1,2</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>Chiba Univ. Hospital)
- 2P5-6\*** Anisotropy of ultrasonically induced electric potentials in bovine cortical bone  
 ○Tsukasa Nakamura, Mineaki Takata, Itsuki Michimoto, Tomoya Oda, Shinji Takayanagi, Mami Matsukawa  
 (Doshisha Univ.)
- 2P5-7\*** Simulation Study of Ultrasonic Wave Convergence in the artificial Human Femoral Neck model by X-ray CT  
 ○Takashi Misaki<sup>1</sup>, Masaya Saeki<sup>1</sup>, Leslie Bustamante<sup>1</sup>, Nobuo Niimi<sup>2</sup>, Ko Chiba<sup>3</sup>, Mami Matsukawa<sup>1</sup>  
 (<sup>1</sup>Doshisha Univ., <sup>2</sup>Nippon Sigma, <sup>3</sup>Nagasaki Univ.)
- 2P5-8\*** Ultrasound propagation in diploe of swine skull  
 ○Itsuki Michimoto, Takashi Misaki, Tsukasa Nakamura, Mami Matsukawa (Doshisha Univ.)
- 2P5-9** Effect of Ultrasound Direction on Piezoelectric Signal Generated in Cancellous Bone  
 ○Atsushi Hosokawa (NIT, Akashi College)
- 2P5-10** Uncertainty Evaluation of Temperature Measurement of Tissue Mimicking Material by Thermographic Cameras  
 ○Naohiko Sasajima<sup>1</sup>, Satoshi Yamazaki<sup>2</sup>, Masahiro Yoshioka<sup>1</sup> (<sup>1</sup>AIST, <sup>2</sup>CANON Medical Systems Corp.)
- 2P5-11\*** Fabricaiton of Bone Phantoms Based on Human Bone Data and Ultrasonic Scattering Experiments  
 ○Takazumi Kasuga, Mikitsugu Nakabayashi, Takumi Otani, Shohei Nakata, Masahiro Ohno (Chiba Inst. of Tech.)
- 2P5-12\*** Development of Visualization Method for Wide Range of Temperature Rise Induced by High Intensity Focused Ultrasound Using Tissue-mimicking Phantom  
 ○Yushi Nakamura<sup>1</sup>, Kiyoshi Yoshinaka<sup>2</sup>, Ryo Takagi<sup>2</sup> (<sup>1</sup>Tokyo Denki Univ., <sup>2</sup>AIST)
- 2P5-13\*** Visualization of simulated lymph channels by contrast-enhanced active Doppler ultrasonography using unfocused wave  
 ○Katsuya Saito<sup>1</sup>, Kenji Yoshida<sup>1</sup>, Masaaki Omura<sup>1</sup>, Takuma Oguri<sup>1,2</sup>, Naohisa Kamiyama<sup>2</sup>, Tadashi Yamaguchi<sup>1</sup>  
 (<sup>1</sup>Chiba Univ., <sup>2</sup>GE Healthcare)

- 2P5-14\*** Visualization of cell structure by optical resolution photoacoustic microscopy with sub-micron lateral resolution  
 ○Ryo Shintate<sup>1</sup>, Ryo Nagaoka<sup>2</sup>, Kazuto Kobayashi<sup>3</sup>, Yoshifumi Saijo<sup>1</sup>  
 (<sup>1</sup>Tohoku Univ., <sup>2</sup>Univ. of Toyama, <sup>3</sup>Honda Electronics)
- 2P5-15\*** Effect of Intermittent Duration of Ultrasound Exposure on Bubble Behavior and Temperature Rise in Bubble-Enhanced Ultrasonic Heating  
 ○Sayaka Ito, Yui Tanaka, Shin-ichiro Umemura, Shin Yoshizawa (Tohoku Univ.)
- 2P5-16\*** Fundamental Evaluation of Weighted Filtered Delay Multiply and Sum Beamforming  
 ○Shibuki Yamasaki, Masayuki Tanabe (Kumamoto Univ.)
- 2P5-17** Effect of Receive Aperture Size on Image Quality of Filtered Delay Multiply and Sum Beamforming  
 ○Masayuki Tanabe (Kumamoto Univ.)
- 2P5-18\*** Self Shape Estimation of Ultrasonic Flexible Probe using Direct Waves Among Elements  
 ○Miki Sada, Masayuki Tanabe (Kumamoto Univ.)
- 2P6-1** Time-Delay based Mimicking Dolphin Whistle for Covert Underwater Communication  
 ○Hojun Lee<sup>1</sup>, Jongmin Ahn<sup>1</sup>, Yongcheol Kim<sup>1</sup>, Sangkug Lee<sup>2</sup>, Jaehak Chung<sup>1</sup> (<sup>1</sup>Inha Univ., <sup>2</sup>ADD)
- 2P6-2** Investigation of a channel tracking based time reversal processing for underwater acoustic communication  
 ○Yukihiro Kida, Mitsuyasu Deguchi, Takuya Shimura (JAMSTEC)
- 2P6-3** Analysis of Experimental Results for Space Diversity Techniques in Underwater Acoustic Communication  
 ○Kyu-Chil Park<sup>1</sup>, Hyunsoo Jeong<sup>1</sup>, Jihyun Park<sup>1</sup>, Jinnam Park<sup>2</sup> (<sup>1</sup>Pukyong Nat'l Univ., <sup>2</sup>Kyungsoong Univ.)
- 2P6-4\*** Performance of Autoencoder for Image Denoising in Underwater Communication  
 ○Hyunsoo Jeong, Kyu-Chil Park, Jihyun Park (Pukyong National Univ.)

**16:10-16:55 Biomedical ultrasound II**

**Chair: Ren Koda (Gunma Univ.)**

- 2E3-1** Oscillating endoskeletal antibubbles  
 ○Nobuki Kudo<sup>1</sup>, Rustem Uzbekov<sup>2,3</sup>, Ryonosuke Matsumoto<sup>1</sup>, Ri-ichiro Shimizu<sup>1</sup>, Craig Carlson<sup>4</sup>, Nicole Anderton<sup>4</sup>, Aurélie Deroubaix<sup>4</sup>, Clement Penny<sup>4</sup>, Albert T. Poortinga<sup>5</sup>, David M. Rubin<sup>4</sup>, Ayache Bouakaz<sup>2</sup>, Michiel Postema<sup>4</sup>  
 (<sup>1</sup>Hokkaido Univ., <sup>2</sup>Univ. Tours, <sup>3</sup>Moscow State Univ., <sup>4</sup>Univ. Witwatersrand, <sup>5</sup>Eindhoven Univ. Technol.)
- 2E3-2\*** Basic study on estimation method of shear stress in carotid artery using blood flow imaging  
 ○Ryo Nagaoka<sup>1</sup>, Kazuma Ishikawa<sup>1</sup>, Michiya Mozumi<sup>1</sup>, Magnus Cinthio<sup>2</sup>, Hideyuki Hasegawa<sup>1</sup>  
 (<sup>1</sup>Univ. of Toyama, <sup>2</sup>Lund Univ.)
- 2E3-3** Assessments of propagation of bone-conducted ultrasound presented to the arm using laser-Doppler vibrometry  
 ○Seiji Nakagawa<sup>1,2</sup>, Hiromu Ishikawa<sup>1</sup>, Riki Ogino<sup>1</sup>, Koichiro Doi<sup>1</sup>, Sho Otsuka<sup>1,2</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>Chiba Univ. Hospital)

**17:00-17:20 Awards Ceremony**

**18:00-20:00 Banquet**

**9:00-10:15 High power ultrasound III, Piezoelectric devices III**

**Chair: Subaru Kudo (Ishinomaki Senshu Univ.)**

- 3J1-1 Development of high intensity and high frequency ultrasonic transducers using piezoelectric films**  
○Mutsuo Ishikawa<sup>1</sup>, Ayaho Tsukamoto<sup>1</sup>, Nao Saito<sup>1</sup>, Akito Endo<sup>2</sup>, Shintaro Yasui<sup>3</sup>, Marie Tabaru<sup>3</sup>, Hiroshi Funakubo<sup>3</sup>, Minoru Kurosawa<sup>3</sup> (<sup>1</sup>Toin Univ. of Yokohama, <sup>2</sup>Kishu Giken Kogyo Co., Ltd, <sup>3</sup>Tokyo Tech.)
- 3J1-2\* Evaluation of molecular orientation in the large aperture liquid crystal lens using ultrasound vibration**  
○Yuki Harada<sup>1</sup>, Marina Fukui<sup>1</sup>, Daisuke Koyama<sup>1</sup>, Akira Emoto<sup>2</sup>, Mami Matsukawa<sup>1</sup> (<sup>1</sup>Doshisha Univ., <sup>2</sup>Tokushima Univ.)
- 3J1-3\* Multivariable extremum seeking control of preload controllable rotary ultrasonic motor**  
○Abdullah Mustafa, Takeshi Morita (The Univ. of Tokyo)
- 3J1-4\* Validation of model of kinetics between streptavidin and biotinylated microbubbles**  
○Miyuki Tanaka<sup>1</sup>, Kenji Yoshida<sup>2</sup>, Yoshiaki Watanabe<sup>1</sup> (<sup>1</sup>Doshisha Univ., <sup>2</sup>Chiba Univ.)
- 3J1-5\* Analysis of Longitudinal Leaky SAW on LiNbO<sub>3</sub>/Amorphous Layer/Quartz Structure**  
○Shiori Asakawa<sup>1</sup>, Junki Hayashi<sup>1</sup>, Masashi Suzuki<sup>1</sup>, Shoji Kakio<sup>1</sup>, Ami Tezuka<sup>2</sup>, Hiroyuki Kuwae<sup>2</sup>, Hiroaki Yokota<sup>3</sup>, Toshifumi Yonai<sup>3</sup>, Kazuhito Kishida<sup>3</sup>, Jun Mizuno<sup>2</sup> (<sup>1</sup>Univ. of Yamanashi, <sup>2</sup>Waseda Univ., <sup>3</sup>The Japan Steel Works, Ltd.)

**10:15-11:30 Measurement techniques III, Biomedical ultrasound III**

**Chair: Hideyuki Nomura (Univ. of Electro-Comm.)**

- 3J2-1\* Resonance theory of elastic waves scattered from an elastic cylinder with a spring interface**  
○Kazusa Yamaguchi, Naoki Matsuda, Masaaki Nishikawa, Masaki Hojo (Kyoto Univ.)
- 3J2-2\* GHz surface-wave ultrasound tomography**  
○Hayato Takeda, Paul Otsuka, Motonobu Tomoda, Osamu Matsuda, Oliver B. Wright (Hokkaido Univ.)
- 3J2-3\* Effect of Cavitation Bubbles outside Focal Region on Ultrasonic Heating in High-Intensity Focused Ultrasound Exposure by Split-Aperture Transmission**  
○Yui Tanaka, Shin-ichiro Umemura, Shin Yoshizawa (Tohoku Univ.)
- 3J2-4 Non-invasive measurement of temperature elevation inside tumor tissue of living rat induced by radiofrequency current heating based on statistical analysis of ultrasonic scattered echoes**  
○Michio Takeuchi<sup>1,3</sup>, Toshihiko Sakai<sup>1</sup>, Gabor Andocs<sup>2,3</sup>, Keizo Takao<sup>3</sup>, Ryo Nagaoka<sup>3</sup>, Hideyuki Hasegawa<sup>3</sup> (<sup>1</sup>Tateyama Kagaku Industry Co., Ltd., <sup>2</sup>Tateyama Machine Co., Ltd., <sup>3</sup>Univ. of Toyama)
- 3J2-5 Optical observation of microbubble behaviors in contrast-enhanced active Doppler ultrasonography**  
○Kenji Yoshida, Katsuya Saito, Masaaki Omura, Tadashi Yamaguchi (Chiba Univ.)

**11:30-13:00 LUNCH TIME**

**13:00-13:50 Plenary Talk**

**Chair: Takeshi Morita (Univ. of Tokyo)**

**3PL Evaluation Method of Materials for Power Ultrasonic Applications**

○Kentaro Nakamura (Tokyo Tech.)

**14:00-16:00 Poster Session**

**Chair: Kenji Yoshida (Chiba Univ.)**

**3P1-1\* Carrier dynamics of hopping conduction in high-resistance GaN studied by resonant ultrasound spectroscopy**

○Kanta Adachi<sup>1</sup>, Hiroyuki Waki<sup>1</sup>, Hirotsugu Ogi<sup>2</sup> (<sup>1</sup>Iwate Univ., <sup>2</sup>Osaka Univ.)

**3P1-2\* Surface plasmon resonance sensor for ultrasound in the MHz range**

○Shoya Ueno, Hayato Ichihashi, Takumi Fukunaga, Mami Matsukawa (Doshisha Univ.)

- 3P1-3 Consideration of relationship between crystal structure and coefficient of thermal expansion on Langasite-type piezoelectric single crystals**  
 ○Yuji Ohashi, Yuui Yokota, Masao Yoshino, Akihiro Yamaji, Shunsuke Kurosawa, Kei Kamada, Hiroki Sato, Satoshi Toyoda, Akira Yoshikawa (Tohoku Univ.)
- 3P1-4\* Improvement of piezoelectric properties in ScAlN film by suppression of highly-energetic-negative-ion bombardment from sputtering target**  
 ○Shinji Takayanagi<sup>1</sup>, Rui Kihara<sup>2</sup>, Takahiko Yanagitani<sup>2</sup> (<sup>1</sup>Nagoya Inst. Tech., <sup>2</sup>Waseda Univ.)
- 3P1-5\* Effect of Joint to Flexural Wave Propagating in Honeycomb Sandwich Panel**  
 ○Shotaro Daito, Naoto Wakatsuki, Koichi Mizutani, Tadashi Ebihara (Univ. of Tsukuba)
- 3P1-6 Piezoelectric Properties and Depolarization Temperatures for CuO or B<sub>2</sub>O<sub>3</sub> doped (Bi<sub>0.5</sub>Na<sub>0.5</sub>)TiO<sub>3</sub>-based Ceramics**  
 Takuya Kujirai, Yuka Takagi, ○Hajime Nagata, Tadashi Takenaka (Tokyo Univ. of Sci.)
- 3P1-7\* Poling conditions of PbTiO<sub>3</sub>/TiO<sub>2</sub>**  
 ○Kohei Hirakawa, Takumi Hara, Makiko Kobayashi (Kumamoto Univ.)
- 3P1-8 Active removing of unabsorbed phonon energy in acousto-optic devices**  
 ○Vladimir Molchanov<sup>1</sup>, Konstantin Yushkov<sup>1</sup>, Vasily Gurov<sup>1</sup>, Alexander Chizhikov<sup>1</sup>, Alexander Darinskii<sup>2</sup>  
 (<sup>1</sup>Acousto-Optical Research Center, National University of Science and Technology MISIS,  
<sup>2</sup>Institute of Crystallography FSRC “Crystallography and Photonics”, Russian Academy of Sciences)
- 3P2-1 Laser ultrasonic technique to detect cracks on directed energy deposition (DED) process**  
 ○Harumichi Sato<sup>1</sup>, Hisato Ogiso<sup>1</sup>, Yorihiro Yamashita<sup>2</sup>, Yoshinori Funada<sup>2</sup> (<sup>1</sup>AIST, <sup>2</sup>IRII)
- 3P2-2\* Interfacial Stiffness Evaluation of Adhesively Bonded CFRP Joints Based on the Out-Of-Plane Resonance for the Ultrasonic Wave Incidence**  
 ○Shohei Ito<sup>1</sup>, Kyota Nakagawa<sup>1</sup>, Naoki Mori<sup>1</sup>, Naoki Matsuda<sup>2</sup>, Yasuaki Furuta<sup>2</sup>, Takayuki Kusaka<sup>1</sup>, Masaki Hojo<sup>2</sup>  
 (<sup>1</sup>Ritsumeikan Univ., <sup>2</sup>Kyoto Univ.)
- 3P2-3 Creep-induced Nonlinear Acoustics in High Cr Ferritic Heat Resisting Steel Welded Joint**  
 ○Toshihiro Ohtani<sup>1</sup>, Tatsuki Miura<sup>1</sup>, Yutaka Ishii<sup>1</sup>, Masaaki Tabuchi<sup>2</sup>, Hiromichi Hongo<sup>2</sup> (<sup>1</sup>Shonan Inst. of Tech., <sup>2</sup>NIMS)
- 3P2-4\* Forming and controlling audible spot including wide frequency band with two parametric speakers**  
 ○Takumi Hakamata, Kotaro Hoshiba, Takenobu Tsuchiya, Nobuyuki Endoh (Kanagawa Univ.)
- 3P2-5\* Optimal Subcarrier Design for OFDM in Channels with Nonlinear Distortion**  
 ○Kazuma Tajima, Koichi Mizutani, Naoto Wakatsuki, Tadashi Ebihara (Univ. of Tsukuba)
- 3P2-6\* Digital Acoustic Communication Scheme Suitable for Parametric Loudspeaker**  
 ○Riku Fukuda, Tadashi Ebihara, Koichi Mizutani, Naoto Wakatsuki (Univ. of Tsukuba)
- 3P2-7\* Reduction of false detection of multiple reflections caused by attached seashells in ultrasonic non-contact thickness gauging**  
 ○Shun Uemae<sup>1</sup>, Hiroyoshi Yamashita<sup>1</sup>, Tomoo Sato<sup>2</sup>, Sayuri Matsumoto<sup>2</sup>, Kotaro Hoshiba<sup>1</sup>, Takenobu Tsuchiya<sup>1</sup>, Nobuyuki Endoh<sup>1</sup> (<sup>1</sup>Kanagawa Univ., <sup>2</sup>PARI)
- 3P2-8\* Ranging Experiment of Moving Object Using Acoustical Transponder and Doppler Shifted Reference Signal**  
 ○Hirokazu Iwaya, Koichi Mizutani, Tadashi Ebihara, Naoto Wakatsuki (Univ. of Tsukuba)
- 3P2-9\* Improved Practicality of Ultrasonic Thermometry Utilizing Longitudinal and Transverse Waves**  
 ○Ryoichi Sawada, Ikuo Ihara (Nagaoka Univ. of Tech.)
- 3P2-10\* Accurate Ultrasound Scattering Analysis of the Size Distribution and Mechanical Properties of Microparticles in Liquid**  
 ○Kazuto Tsuji, Tomohisa Norisuye, Hideyuki Nakanishi, Qui Tran-Cong-Miyata (Kyoto Inst. of Tech.)
- 3P2-11\* Interfacial stiffness evaluation based on resonance characteristics of weak bonds due to adherend contamination**  
 ○Yasuaki Furuta<sup>1</sup>, Naoki Matsuda<sup>1</sup>, Naoki Mori<sup>2</sup>, Masaaki Nishikawa<sup>1</sup>, Masaki Hojo<sup>1</sup>, Takayuki Kusaka<sup>2</sup>  
 (<sup>1</sup>Kyoto Univ., <sup>2</sup>Ritsumeikan Univ.)

- 3P2-12 Mechanism of affinity enhanced protein adsorption on bio-nanocapsules studied by viscoelasticity measurement with wireless QCM biosensor**  
 ○Kentaro Noi<sup>1</sup>, Masumi Iijima<sup>2</sup>, Shun'ichi Kuroda<sup>1</sup>, Hirotsugu Ogi<sup>1</sup> (<sup>1</sup>Osaka Univ., <sup>2</sup>Tokyo Univ. of Agric.)
- 3P2-13\* Laser ultrasonic study on the wave velocity in bone with abnormal collagen crosslinks**  
 ○Masaki Kuraoka, Tsukasa Nakamura, Takumi Fukunaga, Hirokazu Yasui, Mami Matsukawa (Doshisha Univ.)
- 3P2-14\* Frequency determination in nondestructive test of semiconductor devices with ultrasound heating**  
 ○Takuto Matsui<sup>1</sup>, Kosuke Tatsumi<sup>1</sup>, Tomohiro Kawashima<sup>1</sup>, Yoshinobu Murakami<sup>1</sup>, Naohiro Hozumi<sup>1</sup>, Toru Matsumoto<sup>2</sup>  
 (<sup>1</sup>Toyohashi Univ. of Tech., <sup>2</sup>Hamamatsu Photonics K.K.)
- 3P3-1 Power Transmission Characteristics of EWC-SPUDT SAW Filter for Inverter Gate Drive Circuit**  
 ○Ken Watada<sup>1</sup>, Fumiya Kobayashi<sup>1</sup>, Ryo Nonaka<sup>1</sup>, Shigeyoshi Goka<sup>1</sup>, Shoji Kakio<sup>2</sup>, Keiji Wada<sup>1</sup>  
 (<sup>1</sup>Tokyo Metropolitan Univ., <sup>2</sup>Univ. of Yamanashi)
- 3P3-2\* Evaluation wide band high frequency diamond SAW resonator using hetero-epitaxial diamond substrate**  
 ○Yusuke Kobayashi<sup>1</sup>, Yuki Asao<sup>2</sup>, Koji Koyama<sup>3</sup>, Seongwoo Kim<sup>3</sup>, Kenya Hashimoto<sup>2</sup>, Shinichi Shikata<sup>1</sup>  
 (<sup>1</sup>Kwansei Gakuin Univ., <sup>2</sup>Chiba Univ., <sup>3</sup>Adamant Namiki Precision Jewel Co., Ltd.)
- 3P3-3 Evaluation of low-intensity ultrasonic transducer for oral treatment**  
 ○Marie Tabaru<sup>1</sup>, Kento Fujii<sup>1</sup>, Kentaro Nakamura<sup>1</sup>, Mutsuo Ishikawa<sup>2</sup>, Kazuaki Nishimura<sup>3</sup>  
 (<sup>1</sup>Tokyo Tech., <sup>2</sup>Toin Univ. of Yokohama, <sup>3</sup>Tohoku Univ.)
- 3P3-4\* Fundamental study on optimization of microchannel structure with respect to wireless PDMS-QCM biosensor**  
 ○Yu Sato<sup>1</sup>, Noriyasu Masumoto<sup>1</sup>, Fumihito Kato<sup>1</sup>, Hirotsugu Ogi<sup>2</sup> (<sup>1</sup>Nippon Inst. of Tech., <sup>2</sup>Osaka Univ.)
- 3P3-5 SAW CO sensors based on SnOx organic-like film with poly ethylene glycol**  
 ○Yung-Yu Chen, Cheng-Hsiu Ho, Ko-Shao Chen (Tatung University)
- 3P3-6 Influence of SH-SAW sensor frequency for engine oil degradation evaluation**  
 ○Kazuki Nakayama, Jun Kondoh (Shizuoka Univ.)
- 3P3-7 Vibration analysis of cantilever beam using impedance-loaded SAW sensor and finite element method**  
 ○Soya Shirai, Jun Kondoh (Shizuoka Univ.)
- 3P3-8 Analysis and verification of surface acoustic wave propagation characteristics in cover glass/liquid layer/LiNbO<sub>3</sub> structure**  
 ○Yota Terakawa, Jun Kondoh (Shizuoka Univ.)
- 3P4-1 Enhancement of bitumen recovery from oil sand in alkaline solution using ultrasound and carbon dioxide**  
 ○Hirokazu Okawa<sup>1</sup>, Tomonao Saito<sup>1</sup>, Shohei Yasuda<sup>1</sup>, Youhei Kawamura<sup>1</sup>, Tayfun Babadagli<sup>2</sup>, Takahiro Kato<sup>1</sup>,  
 Katsuyasu Sugawara<sup>1</sup> (<sup>1</sup>Akita Univ., <sup>2</sup>Univ. of Alberta)
- 3P4-2 Orientation control of osteoblast-like cells using ultrasound vibration**  
 ○Serina Tawa, Naoyuki Taya, Daisuke Koyama (Doshisha Univ.)
- 3P4-3 Consideration on Effect of Acoustic Window Material of Tough Hydrophone on the Acoustic Cavitation Bubble Behavior**  
 ○Nagaya Okada<sup>1</sup>, Michihisa Shiiba<sup>2</sup>, Shinobu Yamauchi<sup>3</sup>, Toshio Sato<sup>3</sup>, Shinichi Takeuchi<sup>3</sup>  
 (<sup>1</sup>Honda Electronics, <sup>2</sup>Nihon Inst. of Med. Sci., <sup>3</sup>Toin Univ. of Yokohama)
- 3P4-4 Classification of Radial Oscillation Characteristics of Acoustic Cavitation Bubbles Measured by Laser Scattering Method**  
 ○Takanobu Kuroyama (NIT, Gifu College)
- 3P4-5\* Transient Characteristics of Acoustic Cavitation Noise after Starting Ultrasound Irradiation**  
 ○Fumitaka Yokoyama, Takanobu Kuroyama (NIT, Gifu College)
- 3P4-6 Optical Interferometric Measurement of Vibration Amplitude in High Power Ultrasonic Tool through Vibration-Synchronized Fringe Counting(II) Simplification of the System**  
 ○Kentaro Nakamura (Tokyo Tech.)
- 3P4-7\* Measurement of holding force acting on tabular object in near-field acoustic levitation**  
 ○Kohei Aono, Manabu Aoyagi (Murooran Inst. of Tech.)

- 3P4-8 Liquid Surface Deformation Caused by Acoustic Radiation Force of Focused Ultrasound**  
○Hideyuki Nomura, Masaya Shimomura (Univ. of Electro-Comm.)
- 3P4-9 Development of 58 kHz compact ultrasonic sound source using a circular plate with circumferential excitation**  
○Takuya Asami, Hikaru Miura (Nihon Univ.)
- 3P4-10\* Study on physical modeling of heat phase adjuster in loop-tube type thermoacoustic system**  
○Kazuki Shiraki<sup>1</sup>, Shin-ichi Sakamoto<sup>2</sup>, Yuya Kurata<sup>1</sup>, Yuto Kawashima<sup>1</sup>, Riku Onishi<sup>1</sup>, Yoshiaki Watanabe<sup>1</sup>  
(<sup>1</sup>Doshisha Univ., <sup>2</sup>Univ. of Shiga Pref.)
- 3P4-11\* Variable-focus in radial direction in liquid crystal lens using acoustic radiation force**  
○Jessica Onaka, Yuki Harada, Marina Fukui, Daisuke Koyama, Mami Matsukawa (Doshisha Univ.)
- 3P4-12\* Ultrasonic Linear Motor with Quadruped Stator**  
○Yutaro Tanoue, Takeshi Morita (The Univ. of Tokyo)
- 3P4-13 Multi-manipulation modes of ultrasonic tweezers by DPLUS**  
○Qingyang Liu<sup>1,2</sup>, Kang Chen<sup>2</sup>, Junhui Hu<sup>1</sup>, Takeshi Morita<sup>2</sup>  
(<sup>1</sup>Nanjing Univ. of Aeronautics and Astronautics, <sup>2</sup>The Univ. of Tokyo)
- 3P5-1\* Effect of contact condition of blood vessel wall in thin catheter bending using acoustic radiation force**  
○Junya Takano<sup>1</sup>, Yutaro Kobayashi<sup>1</sup>, Hidetaka Ushimizu<sup>1</sup>, Kansai Okadome<sup>1</sup>, Takashi Mochizuki<sup>2</sup>, Kohji Masuda<sup>1</sup>  
(<sup>1</sup>Tokyo Univ. of A&T, <sup>2</sup>Medical Ultrasound Laboratory Co., Ltd.)
- 3P5-2\* Detection of Avidin-Biotin Latex Agglutination using Ultrasound Scattering Techniques**  
○Kana Kitao, Tomohisa Norisuye, Hideyuki Nakanishi (Kyoto Inst. of Tech.)
- 3P5-3\* Study on effectiveness of anti-infective system using a planar transducer irradiating low-intensity ultrasound to titanium dioxide particles**  
○Mayu Tominaga<sup>1,2</sup>, Akio Kaya<sup>2</sup>, Naotaka Nitta<sup>2</sup>, Yuji Ohta<sup>1</sup> (<sup>1</sup>Ochanomizu Univ., <sup>2</sup>AIST)
- 3P5-4\* Ultrasound Imaging of Cavitation Using Triplet Pulse Sequence in Bubble-enhanced Ultrasonic Heating**  
○Ikumi Shiozaki, Shin-ichiro Umemura, Shin Yoshizawa (Tohoku Univ.)
- 3P5-5\* Viability variation of T-cells under ultrasound exposure according to adhesion condition with microbubbles**  
○Masakazu Seki<sup>1</sup>, Tatsuya Saito<sup>1</sup>, Takuya Otsuka<sup>1</sup>, Naoya Kajita<sup>1</sup>, Takashi Mochizuki<sup>2</sup>, Johan Unga<sup>3</sup>, Ryo Suzuki<sup>3</sup>, Kazuo Maruyama<sup>3</sup>, Kohji Masuda<sup>1</sup> (<sup>1</sup>Tokyo Univ. of A&T, <sup>2</sup>Medical Ultrasound Laboratory Co., Ltd., <sup>3</sup>Teikyo Univ.)
- 3P5-6\* Theoretical analysis of retention distribution of bubble-surrounded cells with tempo-spatial division emission**  
○Takuya Otsuka<sup>1</sup>, Masakazu Seki<sup>1</sup>, Kiyonobu Nozaki<sup>1</sup>, Takumi Chikarashi<sup>1</sup>, Ryota Akutsu<sup>1</sup>, Johan Unga<sup>2</sup>, Kazuo Maruyama<sup>2</sup>, Ryo Suzuki<sup>2</sup>, Kohji Masuda<sup>1</sup> (<sup>1</sup>Tokyo Univ. of A&T, <sup>2</sup>Teikyo Univ.)
- 3P5-7\* Experimental study of damage on vascular endothelial cells according to microbubble concentration and ultrasound exposure**  
○Tatsuya Saito<sup>1</sup>, Masakazu Seki<sup>1</sup>, Takuya Otsuka<sup>1</sup>, Naoya Kajita<sup>1</sup>, Yoshitaka Miyamoto<sup>2</sup>, Johan Unga<sup>3</sup>, Kazuo Maruyama<sup>3</sup>, Ryo Suzuki<sup>3</sup>, Kohji Masuda<sup>1</sup>  
(<sup>1</sup>Tokyo Univ. of A&T, <sup>2</sup>Natl. Center for Child Health and Dev., <sup>3</sup>Teikyo Univ.)
- 3P5-8\* Experimental Investigation of Effect of Ultrasonic Duty Cycle on Generation of Reactive Oxygen Species for Highly Efficient Sonodynamic Treatment**  
○Kenki Tsukahara, Shin-ichiro Umemura, Shin Yoshizawa (Tohoku Univ.)
- 3P5-9 Basic study on differentiation of reflection and scattering components by synthetic aperture method using spherically diverging transmit beams**  
○Kazunori Nagata<sup>1</sup>, Ryo Nagaoka<sup>1</sup>, Jens Erik Wilhjelms<sup>2</sup>, Hideyuki Hasegawa<sup>1</sup>  
(<sup>1</sup>Univ. of Toyama, <sup>2</sup>Technical Univ. Denmark)
- 3P5-10\* Anti-aliasing method for 2D phase-sensitive motion estimator in ultrasound measurement**  
○Michiya Mozumi<sup>1</sup>, Ryo Nagaoka<sup>1</sup>, Magnus Cinthio<sup>2</sup>, Hideyuki Hasegawa<sup>1</sup> (<sup>1</sup>Univ. of Toyama, <sup>2</sup>Lund Univ.)
- 3P5-11 Characteristic analysis on linear regression beamformer**  
○Hideyuki Hasegawa, Ryo Nagaoka (Univ. of Toyama)

- 3P5-12\*** Visualization of ultrasound fields inside a protuberance of water generated by an ultrasonic atomizer  
○Takeshi Aikawa, Nobuki Kudo (Hokkaido Univ.)
- 3P5-13** Detection of Fat Area in Living Body Using Ultrasonic Velocity-Change Method  
○Yuya Inuzuka<sup>1</sup>, Arata Tsuboi<sup>1</sup>, Hana Sonoda<sup>1</sup>, Tetsuya Matsuyama<sup>1</sup>, Kenji Wada<sup>1</sup>, Koichi Okamoto<sup>1</sup>, Toshiyuki Matsunaka<sup>2</sup> (<sup>1</sup>Osaka Pref. Univ., <sup>2</sup>TU Research Lab.)
- 3P5-14\*** Verification of influence of tissue structure on shear wave velocity evaluation  
○Daiki Ito<sup>1</sup>, Atsuko Yamada<sup>1</sup>, Takuma Oguri<sup>1,2</sup>, Kenji Yoshida<sup>1</sup>, Tadashi Yamaguchi<sup>1</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>GE Healthcare)
- 3P5-15** Verification of influence of push pulse irradiation condition on shear wave propagation by actual measurement of phantoms  
○Minoru Ito<sup>1</sup>, Daiki Ito<sup>1</sup>, Masashi Usumura<sup>1</sup>, Takuma Oguri<sup>1,2</sup>, Kenji Yoshida<sup>1</sup>, Mikio Suga<sup>1</sup>, Tadashi Yamaguchi<sup>1</sup> (<sup>1</sup>Chiba Univ., <sup>2</sup>GE Healthcare)
- 3P5-16\*** Control of ultrasound irradiation on long bone: a simulation study  
○Masaya Saeiki<sup>1</sup>, Takashi Misaki<sup>1</sup>, Leslie Bustamante<sup>1</sup>, Yoshiki Nagatani<sup>2</sup>, Ko Chiba<sup>3</sup>, Mami Matsukawa<sup>1</sup> (<sup>1</sup>Doshisha Univ., <sup>2</sup>Kobe City Coll. of Tech., <sup>3</sup>Nagasaki Univ.)
- 3P5-17** Study of Back Scatter Ultrasound Imaging Based on a Machine Learning Technique Using Numerical Simulation  
○Shigeaki Okumura<sup>1</sup>, Yoshiki Nagatani<sup>2</sup>, Shuqiong Wu<sup>3</sup> (<sup>1</sup>MaRI Co., Ltd., <sup>2</sup>Kobe City Coll. of Tech., <sup>3</sup>Kyoto Univ.)
- 3P5-18\*** Effect of Shear Wave Propagation on Estimation of Heating Distribution by High-intensity Focused Ultrasound Using Acoustic Radiation Force Imaging  
○Hiroki Yabata, Shin-ichiro Umemura, Shin Yoshizawa (Tohoku Univ.)
- 3P6-1** Sound propagation from continental shelf to arc  
○Yoshiaki Tsurugaya<sup>1</sup>, Toshiaki Kikuchi<sup>2</sup>, Koichi Mizutani<sup>3</sup> (<sup>1</sup>Sanyo PT, <sup>2</sup>Natl. Defense Academy, <sup>3</sup>Univ. of Tsukuba)
- 3P6-2\*** Improvement of Communication Quality Using Compressed Sensing in Mobile Underwater Acoustic Communication  
○Yushi Tabata<sup>1</sup>, Tadashi Ebihara<sup>1</sup>, Hanako Ogasawara<sup>2</sup>, Koichi Mizutani<sup>1</sup>, Naoto Wakatsuki<sup>1</sup> (<sup>1</sup>Univ. of Tsukuba, <sup>2</sup>Natl. Defense Academy)
- 3P6-3\*** Numerical Simulation of Underwater Digital Acoustic Communication Using Parabolic Reflector  
○Ryotaro Chinone, Takuya Aoki, Tadashi Ebihara, Yuji Sato, Koichi Mizutani, Naoto Wakatsuki (Univ. of Tsukuba)
- 3P6-4** Study on seafloor surface seismic wave velocity estimation and baleen whale call detection at cabled observatories in Japan Trench Area  
○Ryoichi Iwase<sup>1</sup>, Takeshi Nakamura<sup>2</sup> (<sup>1</sup>JAMSTEC, <sup>2</sup>NIED)

**16:10-16:55 Ocean acoustics II, Measurement techniques IV**

**Chair: Takenobu Tsuchiya (Kanagawa Univ.)**

- 3J3-1** Adaptive symbol time adjustment for underwater acoustic communication with nonuniform Doppler shift  
○Mitsuyasu Deguchi, Yukihiko Kida, Yoshitaka Watanabe, Takuya Shimura (JAMSTEC)
- 3J3-2\*** Comparison of vibrational displacements of piezoelectric devices with polished surface by laser speckle interferometer and laser Doppler vibrometer measurements  
○Jing Wang, Yasuaki Watanabe, Takayuki Sato (Tokyo Metropolitan Univ.)
- 3J3-3\*** Highly Sensitive Failure Detection of Mechanical Seals Using High-Frequency Acoustic Emission Waves over 1 MHz  
○Kenji Otsu, Hiroaki Hasegawa, Shuntaro Machida (Hitachi, Ltd.)

**17:00-17:15 CLOSING**