

**The 27th Symposium on ULTRASONIC ELECTRONICS**

15th November, 2006 (Wed)

**9:00 Opening ceremony**

**9:15-10:15 Ultrasonic properties of materials, Phonon physics** Chairman : **Pak-Kon Choi (Meiji Univ.)**

- A-1 Polarization of diffracted light by ultrasound in isotropic phase of liquid crystal  
Junki Miyashita<sup>†</sup>, Tatsuro Matsuoka, Shinobu Koda (Nagoya Univ.)
- A-2 Accurate measurements of elastic constants of sapphire single crystal  
Mototaka Arakawa<sup>†</sup>, Yasuo Madani, Hiroyuki Odagawa, Jun-ichi Kushibiki (Tohoku Univ.)
- A-3 Optical properties of piezoelectric Ta<sub>2</sub>O<sub>5</sub> single crystal film Isao Morita<sup>†</sup>, Yasuhiko Nakagawa, Shoji Kakio (Univ. Yamanashi)
- A-4 Poled domain structure with a surface electrode pair on PMN-PT crystal  
Seishiro Ide<sup>†</sup>, Kentaro Kobari, Toshihiro Tsuji, Kazushi Yamanaka (Univ. Tohoku)

**10:15-10:20 Break**

**10:20-11:50 Bulk wave devices** Chairman : **Yasuaki Watanabe (Tokyo Metropolitan Univ.)**

- B-1 38 GHz bandpass filter using crystal substrate Kenji Kawahata<sup>†</sup>, Fumio Asamura(Nihon Dempa Kogyo), Masayoshi Aikawa(Saga Univ.)
- B-2 Film bulk acoustic resonator using high acoustic impedance electrode  
Masanori Ueda<sup>†</sup>, Tokihiro Nishihara, Shinji Taniguchi, Tsuyoshi Yokoyama, Yoshio Satoh (Fujitsu Laboratories Ltd.)
- B-3 Relationship between frequency characteristics and electrode patterns on BAW resonators  
Kengo Asai<sup>†</sup>, Atsushi Isobe, Hisanori Matsumoto (Hitachi Ltd.)
- B-4 Frequency change of the quartz crystal resonator by ion beam etching  
Tadahisa Shiono<sup>†</sup>, Yusuke Osada (Showa Shinku Co.,Ltd), Yasuhiko Nakagawa (Univ. Yamanashi)
- B-5 Oscillation frequency of QCM-biosensor based on electronic circuit technology for telecommunication  
Shunichi Wakamatsu<sup>†</sup>, Shigenori Watanabe, Takehito Ishii, Mitsuaki Koyama (NDK),Hidenobu Aizawa, Shigeru Kurosawa (AIST)
- B-6 Construction of frequency-change-type single crystal silicon 2-axis acceleration sensor  
Sumio Sugawara, Takashi Saito<sup>†</sup> (Ishinomaki Senshu Univ.)

**11:50-13:00 Lunch**

**13:00-13:45 Invited lecture 1** Chairman : **Kazushi Yamanaka (Tohoku Univ.)**

- INV-1 Scanning nonlinear dielectric microscopy with super-high resolution Yasuo Cho<sup>†</sup> (Tohoku Univ.)

**13:45-13:50 Break**

**13:50-14:35 Underwater ultrasound** Chairman : **Takenobu Tsuchiya (Kanagawa Univ.)**

- C-1 Target strength (TS) pattern measurements of squid using the rotating transducer Ken Ishii<sup>†</sup>, Kouichi Sawada (Nat. Res. Inst. Fish. Eng.)
- C-2 Experiment of time-reversal communication in ocean Takuya Shimura<sup>†</sup>, Yoshitaka Watanabe, Hiroshi Ochi (JAMSTEC)
- C-3 Wave theory analysis of acoustic lens system for real time and high resolution imaging sonar system  
Sayuri Matsumoto<sup>†</sup>(PARI), Takenobu Tsuchiya, Tetsuo Anada, Nobuyuki Endoh (Kanagawa Univ.)

**14:35-14:40 Break**

**14:40-15:40 Medical ultrasound** Chairman : **Iwaki Akiyama (Shonan Inst. of Tech.)**

- D-1 Fundamental study on one dimensional array medical ultrasound probe with piezoelectric poly-crystalline film by hydrothermal method  
- Experimental fabrication and estimation of acoustic characteristics of 1D-array ultrasound probe -  
Akito Endo<sup>†</sup>, Norimichi Kawashima, Shinichi Takeuchi (Toin Univ.),Mutsuo Ishikawa, Minoru Kurosawa (Tokyo Inst. of Tech.)
- D-2 Effects of fine ceramic particle dopant on the acoustic attenuation properties of silicone rubber lens for medical echo probe  
Yohachi Yamashita<sup>†</sup>, Yasuharu Hosono, Kazuhiro Itsumi (Toshiba Research Consulting Co.)
- D-3 Effect of tissue thermal parameters on ultrasonic temperature measurement Chikayoshi Sumi<sup>†</sup>, Hiroyuki Yanagimura (Sophia Univ.)
- D-4 Strain estimation by reducing influences of translational motion of arterial wall caused by heartbeat  
Hideyuki Hasegawa<sup>†</sup>, Hiroshi Kanai (Tohoku Univ.)

**15:40-15:45 Break**

**15:45-16:30 Surface wave devices** Chairman : **Hiroshi Yatsuda (Japan Radio Co., Ltd.)**

- E-1 Small SAW duplexer for W-CDMA full-band having good temperature characteristic Michio Kadota, Takeshi Nakao,  
Kenji Nishiyama<sup>†</sup>, Syunsuke Kido, Masanori Kato, Ryoichi Omote,Hiroshi Yonekura, Norihiko Takada, Ryoichi Kita (Murata Mfg. Co., Ltd.)
- E-2 Improved power durability of diamond SAW resonators Shuichi Kawano<sup>†</sup>, Takatoshi Umeda, Satoshi Fujii (Seiko Epson Corp.)
- E-3 Methanol sensor using surface acoustic wave resonator  
Toru Nomura, Yasutaka Onose<sup>†</sup>, Keisuke Nisida (Shibaura Inst. Tech.), Takayoshi Mochiduki (Star Micronics)

**16:30-19:00 Poster session 1** Chairman : **Subaru Kudo (Ishinomaki Senshu Univ.)**

- P1-1 Study on the room-temperature aging of Cu thin films: Monitoring of elasticity by resonant-ultrasound spectroscopy  
Nobutomo Nakamura<sup>†</sup>, Takeo Nakashima, Hirotosugu Ogi, Masahiko Hirao, Masayoshi Nishiyama (Osaka Univ.)
- P1-2 Piezoelectric properties of (Bi<sub>1/2</sub>Na<sub>1/2</sub>)TiO<sub>3</sub>-based ferroelectric ceramics  
Yasufumi Ozawa<sup>†</sup>, Kazusige Yoshii, Yuji Hiruma, Hajime Nagata, Tadashi Takenaka (Tokyo University of Science)
- P1-3 Statistical mechanical calculation of the ultrasonic relaxation of salt solutions  
Tsuyoshi Yamaguchi<sup>†</sup>, Tatsuro Matsuoka, Shinobu Koda (Nagoya Univ.)
- P1-4 Ultrasonic study of h-BN machinable ceramic Nobuo Kashiwagura<sup>†</sup>, Motoki Satoh, Masayuki Akita, Hiroaki Kamioka (Gifu Univ.)
- P1-5 DC bias field dependence on high-power characteristics for PbTiO<sub>3</sub>-Pb(Mg<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub> electrostrictive ceramics Shuji Hayano<sup>†</sup>(Lead Techno),  
Mikio Umeda (Nagaoka Natl. Coll. Tech.), Sadayuki Takahashi (Lead Techno) , Takahiro Wada (Ryukoku Univ.)
- P1-6 Excitation and detection of ultrasound shear wave by EMAR under high pressure  
Ryuichi Tarumi<sup>†</sup>, Yasunori Kawasaki, Hirotosugu Ogi, Masahiko Hirao, Tomoko Kagayama(Osaka Univ.)
- P1-7 Observation of impulsive ultrasound waveform through micro-bubble Takeki Sato<sup>†</sup>, Hiroshi Inoue (Akita Univ.)
- P1-8 Elastic constants and piezoelectric coefficients of langasite single crystal at low temperatures  
Hiroki Nitta<sup>†</sup>, Ryuichi Tarumi, Hirotosugu Ogi, Masahiko Hirao (Osaka Univ.)
- P1-9 Dependence of physical properties on dopants in superstructure films Shun Fujitsuka<sup>†</sup>, Satoru Noge, Takehiko Uno (Kanagawa Inst. of Tech.)
- P1-10 Growth techniques of single crystal thin films on SiO<sub>2</sub> substrates Satoru Noge<sup>†</sup>, Takehiko Uno (Kanagawa Inst. of Tech.)
- P1-11 Characteristics of receiving sensitivity of ultrasound sensor using a hydrothermal polycrystalline PZT thick film  
Mutsuo Isikawa<sup>†</sup>, Masahiro Takase, Minoru Kurosawa (Tokyo Inst. Tech.)
- P1-12 Aspect ratio dependence of electromechanical coupling coefficient  $k_{31}$  of lateral-excitation piezoelectric vibrator  
Hiroshi Kitsunai, Akito Endo, Tomohito Hasegawa, Shinichi Takeuchi (Toin Univ. of Yokohama)

- Jungsoon Kim<sup>‡</sup> (Tongmyong Univ.), Moojoon Kim, Kanglyeol Ha (Pukyong Univ.), Wenwu Cao (PennState Univ.)
- P1-13 Characterization of all the elastic, piezoelectric, and dielectric constants of tetragonal PMN-PT single crystals  
Sanghan Lee<sup>‡</sup>, Yongrae Roh (Kyungpook Nat. Univ.)
- P1-14 Influence of viscosity loss on 3-D vibrations of VHF rectangular AT-cut quartz plates  
Hitoshi Sekimoto<sup>‡</sup>, Jun Tamura, Shigeyoshi Goka, Yasuaki Watanabe (Tokyo Metropolitan Univ.)
- P1-15 Effects of sputtering gas on the formation of (11-20) textured ZnO films  
Takayuki Kawamoto<sup>‡</sup>, Mami Matsukawa, Yoshiaki Watanabe (Doshisha Univ.), Takahiko Yanagitani (AIST)
- P1-16 Characteristics of shear mode FBAR using (11-20) textured ZnO films  
Takahiko Yanagitani<sup>‡</sup>, Masato Kiuchi (AIST), Mami Matsukawa, Yoshiaki Watanabe (Doshisha Univ.)
- P1-17 Fundamental study on shear mode type solidly mounted resonator  
Takehiko Uno<sup>‡</sup>, Satoru Noge (Kanagawa Inst. Tech.)
- P1-18 Resonators using Lamb wave on AT cut quartz  
Yasuhiko Nakagawa<sup>‡</sup>, Masayuki Momose, Shoji Kakio (Univ. Yamanashi)
- P1-19 The effect of adding coils in dual-input twin-T quartz circuit  
Koichi Hirama<sup>‡</sup>, Yasuhiko Nakagawa (Univ. Yamanashi), Takeshi Yanagisawa (Tokyo Inst. Tech.)
- P1-20 Equivalent network representation for length-extensional vibration modes in a side-plated piezoelectric bar with a varying parameter operating through the transverse piezoelectric effect  
Ken Yamada<sup>‡</sup> (Tohoku Gakuin Univ.)
- P1-21 Power supply for RFID tag by a piezoelectric generator and its application  
Masao Takeuchi<sup>‡</sup>, Kenji Tairaku, Chikahide Takatsu (Tamagawa Univ.)
- P1-22 Fundamental study of the information transmission system for wearable computing devices using ultrasonic  
Shin-nosuke Suzuki<sup>‡</sup>,  
Manabu Ishihara(Oyama NCT.), Tamotsu Katane, Osami Saito (Chiba Univ.), Kazuto Kobayashi (Honda Electronics Co., Ltd)
- P1-23 Local characteristics of resonance patterns in piezoelectric one-dimensional composite system  
Michio Ohki<sup>‡</sup> (Natl. Def. Acad.)
- P1-24 Analysis of vibration mode of antenna structure MEMS using beam theory and quantum mechanical examination of its quantized displacement  
Yoshitada Kobayashi<sup>‡</sup>(Shinshu Univ.), Kiyoshi Ishikawa(Club Analyst), Takanori Suzuki, Hideaki Itoh (Shinshu Univ.)
- P1-25 Mode coupling between two single defects in a sonic/phononic crystal  
Toyokatsu Miyashita<sup>‡</sup>, Naoto Doi (Ryukoku Univ.)
- P1-26 Experimental studies on defect-mode wave guides in a sonic/phononic crystal  
Toyokatsu Miyashita, Wataru Sato<sup>‡</sup>, Yuta Nakaso, Ryota Mukuda (Ryukoku Univ.)
- P1-27 A study on SAW streaming phenomenon based on temperature measurement and observation of streaming in liquids  
Shihoko Ito<sup>‡</sup>, Mitsunori Sugimoto, Yoshikazu Matsui, Jun Kondoh (Shizuoka Univ.)
- P1-28 Measurement of SAW on a quartz ball with proximate electrodes to improve waveforms of ball SAW device  
Satoshi Kai<sup>‡</sup>, Kazunori Ohte, Tsuyoshi Mihara (Tohoku Univ.), Tsuneo Ohgi, Noritaka Nakaso (Toppan Printing Co., Ltd.),  
Ichitaro Satoh, Takeshi Fukiura, Hidekazu Tanaka (Yamatake Corp.), Kazushi Yamanaka (Tohoku Univ.)
- P1-29 Evaluation of response time in ball surface acoustic wave hydrogen sensor  
Takuji Abe<sup>‡</sup>, Naoya Iwata, Toshihiro Tsuji, Tsuyoshi Mihara (Tohoku Univ.), Shingo Akao, Kazuhiro Noguchi,  
Noritaka Nakaso(Toppan Printing Co., Ltd.), Dong Youn Sim (Ball Semiconductor Inc.)  
Yusuke Ebi, Takeshi Fukiura, Hidekazu Tanaka (Yamatake Corp.), Kazushi Yamanaka (Tohoku Univ.)
- P1-30 SAW DNA sensor with micro-fluidic channels  
Jungyul Sakong (Kyungpook Nat. Univ.), Heesu Roh (Korea Science Academy), Yongrae Roh<sup>‡</sup> (Kyungpook Nat. Univ.)
- P1-31 Dynamic response of shear horizontal wave propagation in liquid crystal cell to molecular reorientation  
Masashi Aoki<sup>‡</sup>, Ryotaro Ozaki (National Defense Acad.), Katsumi Yoshino (Shimane Univ.),  
Kohji Toda (Musashi Inst. Tech.), Hiroshi Moritake (National Defense Acad.)
- P1-32 Study of high sensitivity sensor based on high order mode Lamb waves  
Wei Lin<sup>‡</sup>, Li Fan, Changming Gan, Zhemin Zhu (Nanjing Univ.)
- P1-33 Super low velocity/piezoelectric substrate structure with high reflections and application for SAW wide band resonators and low loss unidirectional transducer filters  
Yusuke Satoh<sup>‡</sup>, Kazuhiko Yamanouchi (Tohoku Inst. Tech.)
- P1-34 Fabrication of Si/inlaid-IDT/LiNbO<sub>3</sub> structure for acoustic boundary wave devices  
Nobuhiro Tai<sup>‡</sup>, Tatsuya Omori, Ken-ya Hashimoto, Masatusune Yamaguchi (Chiba Univ.)
- P1-35 Power flow angles for slanted finger SAW filters on langasite substrate  
Mikihiro Goto<sup>‡</sup>, Hiromi Yatsuda (Japan Radio Co., Ltd.), Takao Chiba (Meisei Univ.)
- P1-36 High frequency resonators with excellent temperature characteristic using edge reflection  
Michio Kadota<sup>‡</sup>, Tetsuya Kimura, Daisuke Tamasaki (Murata Mfg. Co., Ltd.)
- P1-37 Evaluation of velocity distribution of prototype ultrasonic surgical knife and coagulation of soft tissue for identification of optimum operation frequency  
Kosuke Ebina<sup>‡</sup>, Hideyuki Hasegawa, Hiroshi Kanai (Tohoku Univ.)
- P1-38 Performance evaluation of miniature ultrasonic probe using PZT poly-crystalline film deposited by hydrothermal method  
Tomohito Hasegawa<sup>‡</sup>, Hiroshi Kitsunai, Norimichi Kawasima, Shinichi Takeuchi (Toin Univ. of Yokohama),  
Mutsuo Ishikawa, Minoru Kurosawa (Tokyo Inst. Tech.)
- P1-39 Development of a mechanical scanning-type IVUS system using a miniature ultrasound motor  
Masayuki Tanabe<sup>‡</sup>, Shangping Xie, Norio Tagawa, Tadashi Moriya (Tokyo Metropolitan Univ.)
- P1-40 Imaging system for ultrasonic endoscopy by using transmitter-reciever pair in the pulse compression technique  
Naoki Ohno<sup>‡</sup>, Shangping Xie, Masayuki Tanabe, Norio Tagawa, Tadashi Moriya (Tokyo Metropolitan Univ.)
- P1-41 Spectroscopic imaging by using ultrasound velocity change caused by optical absorption  
Hiromichi Horinaka<sup>‡</sup>, Toshiyuki Matsunaka, Tomoaki Ura, Takashi Mukaiyama, Naoki Nakamura, Kenji Wada (Osaka Prefecture Univ.)
- P1-42 A study of photoacoustic resonance microscopy for biopsy  
Kanako Hatayama<sup>‡</sup>, Satoshi Sakai, Taku Kanda, Hiroto Tateno, Yoko Tateno (Kagoshima Univ.)
- P1-43 Reseach into a photoacoustic measurement of skeltal muscle in vivo  
Itsuki Takahara<sup>‡</sup>, Hiroto Tateno, Yuu Tsurifune, Taro Takeno (Kagoshima Univ.)
- P1-44 Optical visualization of local variation of microcapsules at a fluid bifurcation and its quantitative evaluation  
Yusuke Muramatsu<sup>‡</sup>, Ikkou Mizobe, Yosuke Yatoji, Kohji Masuda(Tokyo Univ. of A&T), Ken Ishihara (Ehime Univ.)
- P1-45 Microbubble generation from nano-sized ultrasound contrast agent  
Ken-ichi Kawabata<sup>‡</sup>, Akiko Yoshizawa, Hideki Yoshikawa, Takashi Azuma, Shin-ichiro Umemura (Hitachi, Ltd.)
- P1-46 Phantoms for a color Doppler ultrasonic diagnostic instruments  
Toshio Kondo<sup>‡</sup>, Tomoji Yoshida (Tokushima Bunri Univ.), Shin-ichiro Umemura (Kyoto Univ.)
- P1-47 Temperature rise in ultrasound-irradiated phantom contacted with acrylic plate  
Nobuyuki Endoh<sup>‡</sup>, Takenobu Tsuchiya, Shou Oride, Tsunaki Tsuji, Kazuki Nagai, Sinterou Sugimura (Kanagawa Univ.)
- P1-48 Analysis of scatterer structures in ultrasound images using probability density function  
Tadashi Yamaguchi<sup>‡</sup>,  
Hiroyuki Furihata (Chiba Univ.), Naohisa Kamiyama (Toshiba Medical Systems), Lee Sung Ae, Hiroyuki Hachiya (Chiba Univ.)

P1-49	Computation for secondary wave of two frequency ultrasound propagating in biological tissues	Iwaki Akiyama <sup>†</sup> (Shonan Inst. Tech.), Shigemi Saito (Tokai Univ.)
P1-50	Numerical simulation of sound wave propagation with sound absorption by digital Huygens' model	Takao Tsuchiya <sup>†</sup> (Doshisha Univ.)
P1-51	Improving spatial resolution in separation of scatterers by simultaneous receiving of ultrasonic echoes with multi-channel transducer	Yusaku Abe <sup>†</sup> , Hideyuki Hasegawa, Hiroshi Kanai (Tohoku Univ.)
P1-52	Evaluation experiment of ultrasound CT for the abdominal sound speed imaging	Keisuke Nagomi <sup>†</sup> , Hiroshi Fujihira, Akira Yamada (Tokyo Univ. of A&T)
P1-53	A study on the radiation pattern using focusing method for the 3-D medical acoustic imaging system with a reflector and a 2-D array	Hirofumi Taki <sup>†</sup> , Toru Sato (Kyoto Univ.)
P1-54	Motion picture observation of subcutaneous microvessel with the high frequency ultrasound	Shota Suzuki <sup>†</sup> , Akira Yamada (Tokyo Univ. of A&T)
P1-55	Motion-compensated frame-accumulation method for improved image quality of carotid artery	Hideki Yoshikawa <sup>†</sup> , Takashi Azuma, Kazuaki Sasaki, Ken-ichi Kawabata (Hitachi, CRL), Canxing Xu, Siddhartha Sikdar, Ravi Managuli, Yongmin Kim (Univ. of Washington), Shin-ichiro Umemura (Hitachi, CRL)
P1-56	Development of instruction algorithm to control ultrasound probe to obtain standard cross section of heart by video stream	Hirota Matsuura <sup>†</sup> , Ken'ichi Takara, Hiroto Inoue, Rui Takahashi, Kohji Masuda (Tokyo Univ. of A&T)
P1-57	Experimental study for automatic acquisition of cross section of heart by using the detective algorithm of mitral valve with a diagnosis robot	Hiroto Inoue <sup>†</sup> , Takao Imai, Ken'ichi Takara, Taro Sakai, Yusuke Aoki, Kohji Masuda (Tokyo Univ. of A&T)
P1-58	An experiment of wideband underwater acoustic communication using QPSK	Hiroshi Ochi <sup>†</sup> , Yoshitaka Watanabe, Takuya Shimura, Yusuke Yano (JAMSTEC)
P1-59	MSE-OFDM communication in multipath underwater acoustic channel	Chun-Dan Lin <sup>†</sup> (China Univ. of Petroleum), Jong Rak Yoon (Pukyong National Univ.)
P1-60	Features of the broadband acoustic propagation in very shallow water	Seongwook Lee <sup>†</sup> , Kyu-Chil Park, Jong Rak Yoon (Pukyong National Univ.), Phil-Ho Lee (Agency for Defense Development)
P1-61	Time domain analysis of sound propagation in shallow water -Influence of amplitude of reflected pulse wave from sea bottom with transition layer-	Takenobu Tsuchiya <sup>†</sup> (Kanagawa Univ.), Sayuri Matsumoto (PARI), Nobuyuki Endoh (Kanagawa Univ.)
P1-62	An array beam pattern synthesis using partial constrained adaptive optimization	Byung Doo Jun <sup>†</sup> (NEX1FUTURE Co., LTD.), Jun-Seok Lim (Sejong Univ.), Koeng-Mo Sung (Seoul National Univ.)
P1-63	Design of the broadband beamformer for passive sonar arrays	Byung Doo Jun <sup>†</sup> (NEX1FUTURE Co., Ltd.), Moojoon Kim (Pukyong National Univ.), Koeng-Mo Sung (Seoul National Univ.)
P1-64	Examination on small sized and low power transducers for underwater acoustic communication	Yoshitaka Ida <sup>†</sup> , Nobuaki Konishi, Yoshikazu Koike (Shibaura Inst. of Tech.)
P1-65	Motion compensation of synthetic aperture sonar with acceleration sensors	Takao Sawa <sup>†</sup> (JAMSTEC, UEC), Tomoo Kamakura (UEC), Taro Aoki, Jyunichiro Tahara (JAMSTEC)
P1-66	Acoustics monitoring of water atmosphere in Lake Biwa	Takaharu Kitamura <sup>†</sup> , Yoshiaki Watanabe (Doshisha Univ.)

**16th November, 2006 (Thu)**

**9:00-10:30 Measurement technique, Imaging, Non-destructive testing (English session)**  
Chairman : **Oliver B. Wright (Hokkaido Univ.)/Che-Hua Yang (Chang Gung Univ.)**

F-1	Integrity evaluation of rockbolts encapsulated by cement-mortar grouting using ultrasonic guided waves	Shin-In Han <sup>†</sup> , In-Mo Lee (Korea Univ.), Yong-Jun Lee (Posco E&C Co.), Jong-Sub Lee (Korea Univ.)
F-2	Characterization of multi-layered tubes with inhomogeneous material properties using laser ultrasound technique	Yu-An Lai <sup>†</sup> , Che-Hua Yang (Chang Gung Univ.)
F-3	Wedge wave for machine tool inspection	Chia-Hao Hsu, Sung-Nien Du <sup>†</sup> , Che-Hua Yang (Chang Gung Univ.)
F-4	Imaging the propagation of a gigahertz ultrasonic pulse in a transparent medium	Motonobu Tomoda <sup>†</sup> (Hokkaido Univ.), Roberto Li Voti (Universita di Roma), Osamu Matsuda, Oliver B. Wright (Hokkaido Univ.)
F-5	Evaluation of ferroelectric domain boundary by ultrasonic atomic force microscopy using lateral bending mode	Toshihiro Tsuji <sup>†</sup> , Kentaro Kobari, Seishiro Ide, Kazushi Yamanaka (Tohoku Univ.)
F-6	Development of ultrasonic multiple access method by the M-sequence code	Yong Wang <sup>†</sup> , Takehiko Suginochi, Masahiko Hashimoto (Matsushita Electric Industrial Co., Ltd.), Hiroyuki Hachiya (Univ. Chiba)

**10:30-10:40 Break**

**10:40-11:40 Medical ultrasound (English session)** Chairman : **Shin-ichiro Umemura (Kyoto Univ.)**

G-1	A study on pulse-inversion technique applied to semiintermodulated imaging in medical ultrasound with contrast agents	Chung-You Wu <sup>†</sup> (Micro-Star Int'l Co., Ltd.), Wei-Huan Chao (National Taiwan Univ.), Yi-Hong Chou (Veterans General Hospital and National Yang-Ming Univ.)
G-2	Micro bubble trapping by bubble nonlinear oscillation under pumping wave	Yoshiki Yamakoshi <sup>†</sup> , Naritsugu Nakajima, Takashi Miwa (Gunma Univ.)
G-3	Basic investigation on three-dimensional tissue elasticity microscope	Tsuyoshi Shiina <sup>†</sup> , Masashi Yoshida, Makoto Yamakawa (Univ. Tsukuba), Naotaka Nitta (National Inst. Adv. Ind. Sci. Tech.)
G-4	Ultrasonic transmission characteristics of in vitro human cancellous bone	Isao Mano <sup>†</sup> (OYO Electric Co., Ltd.), Tadahito Yamamoto, Hiroshi Hagino, Ryota Teshima (Tottori Univ.), Masahiko Takada (Shiga Univ.), Toshiyuki Tsujimoto (Horiba, Ltd.), Takahiko Otani (Doshisha Univ.)

**11:40-13:00 Lunch**

**13:00-13:45 Invited lecture 2 (English session) co-organized by IEEE UFFC Japan Chapter**  
Chairman : **Tadashi Takenaka (Tokyo Univ. of Science)**

INV-2	The timing system of the European GNSS Galileo	IEEE UFFC-S Distinguished Lecturer Andreas Bauch <sup>†</sup> (Physikalisch-Technische Bundesanstalt)
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**13:45-13:55 Break**

**13:55-14:40 Physical acoustics (English session)** Chairman : **Tomoo Kamakura (Univ. Electro-Commun.)**

H-1	Variation of high power air transducer	Claes Hedberg <sup>†</sup> , Hamid Gazisaeidi (Blekinge Inst. Tech.)
H-2	Ultrasonically enhanced diesel removal from soils	

H-3 Micro-Brillouin scattering study of acoustic properties of protein crystals

Yuji Ike<sup>‡</sup>, Eiji Hashimoto, Yuichi Sehimo, Seiji Kojima (Univ. Tsukuba)**14:40-14:45 Break****14:45-15:30 Device application (English session)**Chairman : **Ken-ya Hashimoto (Chiba Univ.)**

- I-1 Multi-layered transducers using polyurea film  
Marie Nakazawa<sup>‡</sup>, Masaya Tabaru, Kentaro Nakamura, Sadayuki Ueha (Tokyo Inst. Tech.), Akihiro Maezawa (Konica Minolta M.G. INC.)
- I-2 Integrated high temperature longitudinal, shear, and plate acoustic wave transducers  
Makiko Kobayashi<sup>†</sup>, Cheng-Kuei Jen, Yuu Ono (National Research Council Canada), Kuo-Ting Wu (McGill Univ.)
- I-3 Deposition of thin film based on SAW streaming Nobuaki Murochi<sup>‡</sup>, Mitsunori Sugimoto, Yoshikazu Matsui, Jun Kondoh (Shizuoka Univ.)

**15:30-18:00 Poster session 2**Chairman : **Jun Kondoh (Shizuoka Univ.)**

- P2-1 Withdrawn
- P2-2 Impulse response of energy modes with multiresolution analysis in piezoelectric transducer Michio Ohki<sup>†</sup> (Natl. Def. Acad.)
- P2-3 Experimental study on intermediate layer for air-coupled ultrasonic transducer with (0-3) composite materials  
Kazuki Saito<sup>‡</sup>, Morimasa Nishihira, Kazuhiko Imano (Akita Univ.)
- P2-4 Propagation characteristics of negative group velocity of Lamb-type waves in a glass-water-glass layer  
Kojiro Nishimiya<sup>‡</sup>(Univ. Tsukuba), Ken Yamamoto(Kobayashi Inst. Phys. Res.), Koichi Mizutani, Naoto Wakatsuki (Univ. Tsukuba)
- P2-5 A novel magnetic field sensor using piezoelectric vibrations  
Keita Dan<sup>‡</sup>, Kentaro Nakamura, Sadayuki Ueha (Tokyo Inst. of Tech)
- P2-6 Numerical analysis for ultrasonic beam of variable line focus transducer  
Takahiro Aoyagi<sup>‡</sup>, Marie Nakazawa, Kentaro Nakamura, Sadayuki Ueha (Tokyo Tech.)
- P2-7 Time response and spatial distribution of temperature rise due to absorption of ultrasound Chiaki Yamaya<sup>‡</sup>, Hiroshi Inoue (Akita Univ.)
- P2-8 Observation of surface vibrational modes on gel surface by electric field tweezers system  
Maiko Hosoda<sup>‡</sup>, Hideo Ogawa(TDU), Kenshiro Takagi(Univ. of Tokyo), Hiroyasu Nomura(TDU), Keiji Sakai (Univ. of Tokyo)
- P2-9 Characterization of circumferential waves in tubes with laser ultrasound measurements and theoretical modeling  
Chia-Wei Yeh<sup>‡</sup>, Che-Hua Yang (Chang Gung Univ.)
- P2-10 Nondestructive characterization of zircaloy tubes with hydride rims  
I-Hung Liu<sup>†</sup> (National Taipei Univ. of Tech.) , Che-Hua Yang (Chang Gung Univ.)
- P2-11 Dispersion behaviors of wedge waves propagating along wedges tips with coatings  
Sheng-Wei Tang(National Taipei Univ. of Tech.), Che-Hua Yang<sup>†</sup>(Chang Gung Univ.)
- P2-12 Wedge waves propagating along piezoelectric wedges with fluid loading  
Wen-Chi Wang<sup>‡</sup>(National Taipei Univ. of Tech.), Che-Hua Yang (Chang Gung Univ.)
- P2-13 The effects of fluid boundary conditions on the dispersion relations of guided waves propagating in piezoelectric plates  
Che-Hua Yang, Chia-Han Wu<sup>†</sup>, Kuen-Yi Tsai (Chang Gung Univ.)
- P2-14 Angle beam method to identify leaky Lamb wave modes in an elastic plate  
Young H. Kim<sup>†</sup> (Korea Science Academy), S. J. Song (Sungkyunkwan Univ.), S. D. Kwon (Andong National Univ.)
- P2-15 Discontinuity detection of rock mass by ultrasonic waves  
Jong-Sub Lee<sup>‡</sup>, Seung-Sun Kim (Korea Univ.), Dong-Hyun Kim, Uk-Young Kim (GS E&C Co.), In-Mo Lee (Korea Univ.)
- P2-16 Rock property evaluation using wavelet transform analysis Sung-Won Lee<sup>‡</sup>, Sung-Wan Hong (KICT), Jong-Sub Lee, In-Mo Lee (Korea Univ.)
- P2-17 Ultrasonic measurement of cylindrical rock specimens: Engineering modulus interpretation  
Min-Su Cha, Gye-Chun Cho<sup>‡</sup> (Korea Adv. Inst. Sci. Tech.)
- P2-18 Detection of concrete crack using giant-magnetostriction vibrator  
Youhei Kawamura, Michinori Asaka<sup>†</sup>, Eui Seong Ha, Yu Ito (Univ. of Tsukuba), Koichi Okawa (Akita Univ.), Koichi Mizutani (Univ. of Tsukuba)
- P2-19 Validation of effectiveness on magnified cross-correlation analysis in frequency domain based on directivity of giant-magnetostriction vibrator  
Eui Seong Ha<sup>†</sup>, Youhei Kawamura, Koichi Mizutani (Univ. of Tsukuba), Koichi Okawa (Akita Univ.), Michinori Asaka (Univ. of Tsukuba)
- P2-20 Absolute measurement of surface vibrational distribution in piezoelectric devices using burst-wave driving  
Sunao Ishii<sup>‡</sup>, Yasuaki Watanabe, Noriyuki Imaeda, Shigeyoshi Goka, Takayuki Sato, Hitoshi Sekimoto (Tokyo Metropolitan Univ.)
- P2-21 Quantitative characterization of two kinds of surface roughness parameters from air-coupled ultrasound scattering  
Deden Dian Sukmana<sup>‡</sup>, Ikuo Ihara (Nagaoka Univ. Tech.)
- P2-22 Diagonally staggered grid for elastodynamic analysis by finite-difference time-domain method Masahiro Sato<sup>‡</sup> (Akita Univ.)
- P2-23 Recognition system for WDM time-series optical coded labels using collinear acoustooptic devices without time gates  
Nobuo Goto<sup>‡</sup> (Toyoashi Univ. of Tech), Yasumitsu Miyazaki (Aichi Univ. of Tech.)
- P2-24 Monolithically integrated tandem waveguide-type acoustooptic modulator driven by surface acoustic waves  
Shoji Kakio, Shinji Uotani, Motoki Kitamura<sup>‡</sup>, Yasuhiko Nakagawa (Univ. of Yamanashi), Takefumi Hara, Hiromasa Ito (Tohoku Univ.), Tetsuya Kobayashi, Masayuki Watanabe (Optoquest Corp.)
- P2-25 Beam-propagation analysis of RGB acoustooptic modulator driven by surface acoustic waves  
Hiroyuki Kawate<sup>‡</sup>, Shoji Kakio, Yasuhiko Nakagawa (Univ. of Yamanashi), Takefumi Hara, Hiromasa Ito (Tohoku Univ.), Tetsuya Kobayashi, Masayuki Watanabe (Optoquest Corp.)
- P2-26 Powerful potentiality of second order harmonic in nonlinear acoustic wave propagating on LiNbO<sub>3</sub> substrate  
Yoshiaki Tokunaga, Masaki Suzuki, Masashi Imai<sup>†</sup> (Kanazawa Inst. Tech.)
- P2-27 FBG vibration sensor array with temperature compensation using semiconductor optical amplifier tunable laser source  
Kiyoyuki Inamoto<sup>‡</sup>, Satoshi Tanaka, Hiroki Yokosuka, Nobuaki Takahashi (National Defense Academy)
- P2-28 Fast temperature-response operation of WDM FBG underwater acoustic sensor array Hiroki Yokosuka<sup>‡</sup>, Satoshi Tanaka, Kiyoyuki Inamoto, Nobuaki Takahashi (National Defense Academy), Takao Sawa, Kenichi Asakawa (JAMSTEC)
- P2-29 Basic study on fabrication technology of MEMS transducer Manabu Yokota<sup>†</sup> (Kanagawa Inst. of Tech.), Kouji Sakata (Fuji Electric System), Takanori Yamasaki, Keishin Koh, Kohji Hohkawa (Kanagawa Inst. of Tech.)
- P2-30 Development of a high-sensitive electrodeless QCM immunosensor  
Kazuma Motohisa<sup>‡</sup>, Kenichi Hatanaka, Toshinobu Ohmori, Hirotsugu Ogi, Masahiko Hirao (Univ. Osaka)
- P2-31 Shape memory piezoelectric actuator Takeshi Morita<sup>‡</sup>, Yoichi Kadota, Hiroshi Hosaka (Univ. of Tokyo)
- P2-32 Load characteristics of a diagonally symmetric form ultrasonic motor using a LiNbO<sub>3</sub> plate  
Koujiro Kawai<sup>‡</sup>, Hideki Tamura (Yamagata Univ.), Takehiro Takano (Tohoku Inst. of Tech.), Yoshiro Tomikawa, Seiji Hirose (Yamagata Univ.), Manabu Aoyagi (Murooran Inst. of Tech.)

- P2-33 Measurement of an imaginary part of complex Young's modulus of silicone rubber using impedance change of a quartz-crystal tuning-fork tactile sensor  
Hideaki Itoh(Shinshu Univ.)
- P2-34 Assessment of paper's roughness using a quartz-crystal tuning-fork tactile sensor  
Yasuhiro Takeuchi<sup>†</sup>, Nobuhiro Yosii, Hideaki Itoh (Univ. Shinshu)
- P2-35 Experimental study on sensitivity of piezoelectric vibratory tactile sensor  
Subaru Kudo<sup>†</sup> (Ishinomaki Senshu Univ.)
- P2-36 Basic study on a threefold rotatory symmetric form quartz vibrator for triaxial gyrosensor  
Toshiaki Soneda<sup>†</sup>, Hideki Tamura, Yoshiro Tomikawa, Seiji Hirose (Yamagata Univ.)
- P2-37 Packaging of SAW devices with small, low profile and hermetic performance  
Osamu Kawauchi, Kaoru Sakinada<sup>†</sup>, Yasufumi Kaneda, Satoru Ono(Fujitsu Media Devices Ltd.)
- P2-38 Smaller SAW duplexer for US-PCS having good temperature characteristic  
Takeshi Nakao<sup>†</sup>, Michio Kadota, Kenji Nishiyama, Yasuharu Nakai, Daisuke Yamamoto, Yutaka Ishiura, Tomohisa Komura, Norihiko Takada, Ryoichi Kita (Murata Mfg. Co., Ltd.)
- P2-39 Surface acoustic wave devices using AlGaIn/GaN heterostructures  
Takahiro Mizusawa<sup>†</sup>, Manabu Yokota, Keishin Koh, Kohji Hokawa (Kanagawa Inst. of Tech.)  
Kazumi Nishimura, Naoteru Sigeawa (NTT Photonics Lab.)
- P2-40 Fabrication and evaluation of potassium niobate thin-film by RF sputtering  
Tatsunori Suzuki<sup>†</sup>, Hajime Kurosawa, Shoji Kakio, Yasuhiko Nakagawa (Univ. of Yamanashi)
- P2-41 Reflection properties of SH-type SAW in periodic gold grating on langasite  
Satoshi Tanabe<sup>†</sup>, Shoji Kakio, Yasuhiko Nakagawa (Univ. of Yamanashi)
- P2-42 Degradation of chlorinated compounds and phenol mixtures by ultrasound  
Myunghee Lim<sup>†</sup>, Younggyu Son, Qiongyuan Gao, Sunmee Kim (Korea Univ.), Younguk Kim (Myongji Univ.), Jeehyeong Khim (Korea Univ.)
- P2-43 The effects of pH on the sonolysis of PCE  
Qiongyuan Gao<sup>†</sup>, Myunghee Lim, Sunmee Kim, Jongtae Kim (Korea Univ.), Younguk Kim (Myongji Univ.), Jeehyeong Khim (Korea Univ.)
- P2-44 Effects of aqueous temperature on sonolysis of bisphenol A  
M. Helal Uddin<sup>†</sup>, Shin-ichi Hatanaka, Shigeo Hayashi (Univ. of Electro-Commun.)
- P2-45 Effect of trabecular irregularity on fast and slow wave propagations in cancellous bone  
Atsushi Hosokawa<sup>†</sup> (Akashi National Coll. Tech.)
- P2-46 Attenuation compensation of soft tissue for acoustic impedance measurement of in vivo bone by transducer vibration method  
Masasumi Yoshizawa<sup>†</sup>, Yuuta Nakamura, Masataka Ishiguro (Tokyo Metropol. Coll. of Ind. Tech.), Tadashi Moriya (Tokyo Metropol. Univ.)
- P2-47 Longitudinal wave velocity and orientation of HAp crystallites in local area of bovine femoral cortical bone  
Yu Yamato<sup>†</sup> (Hamamatsu Univ. Sch. Med.), Hirofumi Mizukawa (Doshisha Univ.), Takahiko Yanagitani (AIST), Mami Matsukawa (Doshisha Univ.), Kaoru Yamazaki, Akira Nagano (Hamamatsu Univ. Sch. Med.)
- P2-48 A study of osteoporosis by using twist oscillator  
Toru Taniguchi<sup>†</sup>, Hiroto Tateno, Syo Matsushita, Taro Tateno (Kagoshima Univ.)
- P2-49 A Study of drugs infusion by ultrasonic method  
Megumi Fukuda<sup>†</sup>, Yuu Turifune, Kuninori Suzuki, Hiroto Tateno (Univ. Kagoshima)
- P2-50 Ultrasonic strain-measurement-based shear modulus reconstruction: Case using lateral strain ratio  
Chikayoshi Sumi<sup>†</sup> (Sophia Univ.)
- P2-51 Improvement of tissue elasticity image quality for anechoic area using iterative correction method  
Makoto Yamakawa<sup>†</sup>, Tsuyoshi Shiina (Univ. of Tsukuba)
- P2-52 An approach to real-time imaging of local tissue elasticity utilizing aperture synthetic motion vector measurement system  
Atsushi Sanuga<sup>†</sup>, Shin-ichi Yagi (Univ. Meisei), Yuji Kondo, Kiyoshi Tamura (Aloka Co., Ltd.), Masakazu Sato (Microsonic Co., Ltd.)
- P2-53 Analysis of tissue displacement induced by ultrasonic radiation force using MRI  
Naotaka Nitta<sup>†</sup>, Kazuhiro Homma, Keigo Hikishima (AIST)
- P2-54 Tissue classification of artery wall based on elasticity distribution in region of interest determined by spatial resolution of ultrasound  
Kentaro Tsuzuki<sup>†</sup>, Hideyuki Hasegawa, Hiroshi Kanai (Tohoku Univ.), Masataka Ichiki (Sendai Hospital of East Railway Co.), Fumiaki Tezuka (Sendai Medical Center)
- P2-55 Angular dependence of ultrasonic echo for imaging micro-order surface roughness  
Kazuki Kudo<sup>†</sup>, Hideyuki Hasegawa, Hiroshi Kanai (Tohoku Univ.)
- P2-56 Ultrasonic measurement of change in elasticity of intima-media region for radial artery due to flow-mediated dilation  
Takuya Kaneko<sup>†</sup>, Hideyuki Hasegawa, Hiroshi Kanai (Tohoku Univ.)
- P2-57 Imaging of transition in myocardial contraction and relaxation by measuring strain rate at high temporal resolution  
Hiroki Yoshiara<sup>†</sup>, Hideyuki Hasegawa, Hiroshi Kanai (Tohoku Univ.), Motonao Tanaka (Tohoku Welfare Pension Hospital)
- P2-58 Angular dependence of ultrasonic scattering from wire phantom mimicking myocardial fiber  
Teppei Onodera<sup>†</sup>, Hideyuki Hasegawa, Hiroshi Kanai (Tohoku Univ.)
- P2-59 Ultrasonic measurement of distribution of longitudinal displacement along the radial direction of carotid arterial wall  
Takanori Numata<sup>†</sup>, Hideyuki Hasegawa, Hiroshi Kanai (Tohoku Univ.)
- P2-60 A 2D-array of multi-degree-of-freedom ultrasonic actuators  
Yasuyuki Gohda<sup>†</sup>, Daisuke Koyama, Kentaro Nakamura, Sadayuki Ueha (Tokyo Inst. of Tech.)
- P2-61 Behavior of microjets generated in molten metal  
Yasuo Saiki<sup>†</sup>, Takashi Kudo, Mamoru Kuwabara, Jian Yang (Nagoya Univ.)
- P2-62 Study on scattering by SAW motor slider using FEM simulation  
Minoru Kuribayashi Kurosawa<sup>†</sup>, Yoshito Miyazaki, Takashi Shigematsu (Tokyo Inst. of Tech.)
- P2-63 Effect of high intensity ultrasound on consolidation of soft clay  
Jong-Sub Lee, Woo-Jin Lee (Korea Univ.), Jung-Ha Hwang<sup>†</sup>, Young U. Kim (Myongji Univ.)
- P2-64 Imperfections of parametrically generated sound beams caused by reflexions  
Dirk Olszewski<sup>†</sup>, Klaus Linhard (DaimlerChrysler Research and Technology)
- P2-65 Optimum carrier frequency for ultrasound loudspeaker  
Dirk Olszewski<sup>†</sup> (DaimlerChrysler Research and Technology)
- P2-66 Evaluation of piezoelectric power generator using barium titanate based ceramics  
Tatsunori Kakuda<sup>†</sup>, Tomoaki Futakuchi (Toyama Industrial Technology Center)
- P2-67 Design of an absolutely aplanatic acoustic lens  
Yuji Sato<sup>†</sup>, Ayano Miyazaki, Youichi Miyazaki, Kazuyoshi Mori, Toshiaki Nakamura (National Defense Academy)
- P2-68 Comparison of sound pressure fields focused by a spherical and three kinds of aspherical biconcave lenses  
Ayano Miyazaki<sup>†</sup>, Youichi Miyazaki, Yuji Sato, Kazuyoshi Mori, Toshiaki Nakamura (National Defense Academy)
- P2-69 An analysis on focusing characteristics for phase continuous Fresnel lens using FDTD method  
Kazuyoshi Mori<sup>†</sup>, Ayano Miyazaki, Hanako Ogasawara, Toshiaki Nakamura (National Defense Academy), Yasuhito Takeuchi (Kagoshima Univ.)
- P2-70 Analysis of long-distance propagation time differences in the Central Pacific  
Hanako Ogasawara<sup>†</sup>, Toshiaki Nakamura (National Defense Academy), Hidetoshi Fujimori (JAMSTEC), Koichi Mizutani (Univ. of Tsukuba)

**18:40 Banquet****17th November, 2006 (Fri)**

<b>9:00-10:15 High power ultrasound</b>		<b>Chairman : Minoru Kurosawa (Tokyo Inst. of Tech.)</b>
J-1	High-efficiency ultrasonic device transducer for facial care products Mahito Nunomura <sup>†</sup> , Itaru Saida, Kazuyasu Ikadai, Hideaki Abe (Matsushita Electric Works, Ltd.)	
J-2	Miniature cantilever-type ultrasonic motor using Pb-free multilayer-piezoelectric ceramics Yutaka Doshida <sup>†</sup> (Taiyo Yuden Co., Ltd., Yamagata Univ.), Sumiaki Kishimoto, Keisuke Ishii, Hiroshi Kishi (Taiyo Yuden Co., Ltd.), Hideki Tamura, Yoshiro Tomikawa, Seiji Hirose (Yamagata Univ.)	
J-3	Removal of gas using sprinkle water by aerial ultrasonic wave Hikaru Miura <sup>†</sup> (Nihon Univ.)	
J-4	Mechanism of dissociating methane hydrate by ultrasonic vibration Daisuke Tajima <sup>†</sup> , Kenichiro Tsuyuki, Shinichi Tokaji, Satoru Miura (Kajima Corporation.)	
J-5	A droplet generation by ultrasonic vibration of micropore Naoyuki Ishikawa <sup>†</sup> , Takefumi Kanda, Koichi Suzumori, Hidekazu Yoshizawa (Okayama Univ.), Yoshiaki Yamada (Industrial Promotion Foundation, Okayama Pref.)	

**10:15-10:20 Break**

<b>10:20-11:50 Measurement techniques, Imaging, Nondestructive testing</b>		<b>Chairman : Masahiro Ohno (Chiba Inst. Tech.) / Masahiko Hirao (Osaka Univ.)</b>
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K-1	Visualization of small cracks by leaky waves using laser-ultrasonics Takashi Miura <sup>†</sup> , Makoto Ochiai, Satoshi Yamamoto, Mikio Izumi (Toshiba Corp.)	
K-2	Measurement of acoustic field using singed Schlieren imaging Takashi Azuma <sup>†</sup> (Hitachi CRL), Shin-ichiro Umemura (Kyoto Univ.)	
K-3	Theoretical and experimental investigation of guide wave flow meter Harumichi Sato <sup>†</sup> (AIST), Maxim Lebedev(Tokyo Keiso Co., Ltd.), Jun Akedo (AIST)	
K-4	A real time detection of harmonic components from closed-crack in the metal rod using double-layered piezoelectric transducer Makoto Fukuda <sup>†</sup> , Morimasa Nishihara, Kazuhiko Imano (Akita Univ.)	
K-5	Analysis of ball SAW sensor response to a wide variety of gases using gas chromatography Naoya Iwata <sup>†</sup> , Takuji Abe, Toshihiro Tsuji, Tsuyoshi Mihara(Tohoku Univ.), Shingo Akao(Toppan Printing, Tohoku Univ.), Kazushi Yamanaka (Tohoku Univ.)	
K-6	Viscometer of noncontact type using aerial sound Masayuki Ito <sup>†</sup> , Hidekazu Tai, Tsutomu Kobayashi (Nihon Univ.)	

**11:50-13:00 Lunch**

<b>13:00-13:45 Invited lecture 3</b>		<b>Chairman : Shinobu Koda (Nagoya Univ.)</b>
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INV-3	Molecular bioeffects of ultrasound and its therapeutic applications Takashi Kondo <sup>†</sup> , Qing-Li Zhao, Rhohei Ogawa, Yoshiaki Tabuchi (Univ. of Toyama)	
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**13:45-16:15 Poster session 3**

<b>13:45-16:15 Poster session 3</b>		<b>Chairman : Keiji Sakai (Univ. of Tokyo.)</b>
P3-1	Two-dimensional anemometer with single pair of ultrasonic transducers by use of reflected wave Ikumi Saito <sup>†</sup> , Koichi Mizutani, Naoto Wakatsuki (Univ. of Tsukuba)	
P3-2	Crosswind velocity measurement using ultrasonic delay line Akihiko Kon <sup>†</sup> (Univ. of Tsukuba, Yamatake Corp.), Koichi Mizutani, Naoto Wakatsuki (Univ. of Tsukuba)	
P3-3	Acoustic communication in air using DBPSK with influence by impulse response Keiichi Mizutani <sup>†</sup> (Osaka Prefecture Univ.), Naoto Wakatsuki, Koichi Mizutani (Univ. of Tsukuba)	
P3-4	Measuring sound fields in air by Michelson interferometer Shingo Shibata <sup>†</sup> , Takeshi Ohbuchi, Koichi Mizutani, Naoto Wakatsuki (Univ. of Tsukuba)	
P3-5	Measurement of temperature distribution on the surface of acoustic reactor by use of thermal video system Takashi Kubo <sup>†</sup> , Jian Yang, Mamoru Kuwabara (Nagoya Univ.)	
P3-6	Applications of a pinhole-based low-frequency air-coupled ultrasonic system into precision displacement measurements Katsuhiro Sasaki <sup>†</sup> , Morimasa Nishihara, Kazuhiko Imano (Akita Univ.)	
P3-7	Precise position measurement of objects using an acoustic M-sequence signal in the air Kuramitsu Nishihara <sup>†</sup> , Tadashi Yamaguchi, Hiroyuki Hachiya (Chiba Univ.)	
P3-8	Calibration of hydrophone sensitivity using planar scanning method: Effect of nonlinear propagation Tsuneo Kikuchi <sup>†</sup> , Masahiro Yoshioka, Sojun Sato (AIST)	
P3-9	Measurement of the acoustic property of small volume liquid sample beyond acoustic window Shigemi Saito <sup>†</sup> (Tokai Univ.)	
P3-10	Measurements of intense ultrasound field in air using a fiber optic probe Hiroyuki Takei <sup>†</sup> , Takeshi Hasegawa, Kentaro Nakamura, Sadayuki Ueha (Tokyo Tech.)	
P3-11	Theoretical study of determining accurate acoustical physical constants of piezoelectric hexagonal single crystals Yuji Ohashi <sup>†</sup> , Mototaka Arakawa, Hiroyuki Odagawa, Jun-ichi Kushibiki (Tohoku Univ.)	
P3-12	High-resolution-acoustic imaging of material properties using scanning probe microscopy Keiji Takata <sup>†</sup> (Hitachi, Ltd.)	
P3-13	An edge mode probe sensor for scanning probe microscopy Kouji Honda <sup>†</sup> , Takefumi Kanda, Koichi Suzumori (Okayama Univ.)	
P3-14	Comparison of ultrasonic hardness-tester hardness and micro-Vickers hardness Ryoji Aoyagi <sup>†</sup> (Sendai National College of Technology), Kaoru Umezu (Sacra-tech)	
P3-15	Detection of backwall slit by laser ultrasonic technique Hiroyuki Fukutomi, Tetsuo Fukuchi, Takeshi Okuyama <sup>†</sup> , Takashi Ogata (CRIEPI)	
P3-16	Development of a multi-beam laser ultrasonic system Tetsuo Fukuchi <sup>†</sup> , Takeshi Okuyama, Hiroyuki Fukutomi, Takashi Ogata (CRIEPI)	
P3-17	Ultraviolet-laser excitation microscopic photothermal lens imaging for observing biological cells Akira Harata <sup>†</sup> , Takashi Matuda, Satoshi Hirashima (Kyushu Univ.)	
P3-18	Ultrasonic transmission images using phase conjugate waves Tatsuya Seki <sup>†</sup> , Hiroaki Ishida, Masahiro Ohno (Chiba Inst. of Tech.)	
P3-19	Imaging of the vortex air flow profile by acoustic tomography Kazuhiro Hayashi <sup>†</sup> , Haiyue Li, Takaaki Ueki, Akira Yamada (Tokyo Univ. of A&T)	
P3-20	Discussion on transmission and reception of SV wave propagating along surface of test object Tomonori Kimura <sup>†</sup> , Koichiro Misu, Shusou Wadaka (Mitsubishi Electric Corp.), Mitsuhiro Koike (Ryoden Shonan Electronics Corp.)	
P3-21	On SH wave propagating in a pipe in the longitudinal direction Takahiro Hayashi <sup>†</sup> (Nagoya Inst. Tech.), Sachiro Sugimoto, Yoshihide Tanaka (Ryoden Syonan Electronics)	
P3-22	Generations of circumferential guided waves propagating in a pipe using a bulk shear wave sensor Hideo Nishino <sup>†</sup> , Ryuichi Yokoyama, Kenichi Yoshida (Univ. Tokushima)	
P3-23	Higher harmonic imaging of minute damage in engineering materials Morimasa Murase <sup>†</sup> , Koichiro Kawashima (Ultrasonic Materials Diagnosis Lab.)	

- P3-24 Nonlinear acoustic evaluation of creep damage in boiler heat exchange tubes Toshihiro Ohtani<sup>†</sup> (Ebara Research Co.), Koichiro Kawashima (Ultrasonic Materials Diagnosis Lab.), Michael Drew, Paul Guagliardi (Australian Nuclear Science & Technology Org.)
- P3-25 Optimization of input amplitude for closed-crack imaging by nonlinear response of acoustic waves Yoshikazu Ohara<sup>†</sup>, Setsu Yamamoto, Tsuyoshi Mihara, Kazushi Yamanaka (Tohoku Univ.)
- P3-26 Ultrasonic measuring method of accumulated compressive elasticity strain energy on the compression stress strain metal beam using sing-around method Masaaki Ohashi<sup>†</sup> (Shibaura Inst. of Tech.)
- P3-27 Evaluation of rubber viscoelasticity by pulse echo method Junjie Chang<sup>†</sup> (Dalian Maritime Univ.)
- P3-28 Evaluation on elastic constants of an antifouling paint film using group delay spectrum method Shinobu Sugawara<sup>†</sup>, Toshiaki Shibata (National Maritime Research Inst.)
- P3-29 Lateral resolution of 3D underground imaging Liang Tao<sup>†</sup>, Seiichi Motooka (Chiba Inst. Tech.)
- P3-30 Sound radiation analysis of a board-type speaker based on Lamb wave propagation Kazunori Kawashima<sup>†</sup>, Naoto Wakatsuki, Koichi Mizutani (Univ. of Tsukuba)
- P3-31 Development of capacitive ultrasonic sensor having parylene film by micromachining technique Katsuhide Furukawa<sup>†</sup>, Seiji Aoyagi (Kansai Univ.), Kaoru Yamashita, Masanobu Okuyama (Osaka Univ.)
- P3-32 Integration technology of two-dimensional ultrasonic transducers Yuji Terao<sup>†</sup>, Manabu Yokota, Keishin Koh, Kohji Hokawa (Kanagawa Inst. of Tech.)
- P3-33 Thermal diffusivity of semi-insulating 6H-SiC single crystal wafers evaluated by photopyroelectric (PPE) method Watimakun Passapong<sup>†</sup>, Taichiro Mori, Hisashi Miyazaki, Yoichi Okamoto, Jun Morimoto (National Defense Academy), Toshihiko Hayashi, Hiromu Shiomi (SiXON, Ltd.)
- P3-34 Nonradiative recombination process in semi-insulating 6H-SiC bulk single crystals evaluated by photoacoustic spectroscopy Taichiro Mori<sup>†</sup>, Wutimakun Passapong, Hisashi Miyazaki, Jun Morimoto (National Defense Academy), Toshihiko Hayashi, Hiromu Shiomi (SiXON, Ltd.)
- P3-35 Structure and photoacoustic spectra of Y-doped Eu<sub>2</sub>W<sub>2</sub>O<sub>9</sub> phosphor Atsushi Aruga<sup>†</sup>, Yoichi Okamoto, Masahiro Tsuchiya (Nat. Def. Acad.)
- P3-36 Evaluation of weldment by photothermal electrochemical(PE) detection Yoichiro Hiwatashi, Ryota Kamata<sup>†</sup>, Haruo Endoh, Tsutomu Hoshimiya (Tohoku Gakuin Univ.)
- P3-37 Nondestructive evaluation of wedge-shaped surface defects by photoacoustic microscopy Haruo Endoh, Naoki Ohtaki<sup>†</sup>, Yoichiro Hiwatashi, Tsutomu Hoshimiya (Tohoku Gakuin Univ.)
- P3-38 Photoacoustic and photoelectrochemical characterization of CdSe quantum dots grafted onto fluorine-doped tin oxide (FTO) glass and nanostructured SnO<sub>2</sub> electrode Taro Toyoda, Makoto Yanai<sup>†</sup>, Qing Shen (Univ. Electro-Commun.), Kenji Katayama (Chuo Univ.), Tsuguo Sawada (Tokyo Univ. A&T)
- P3-39 Effect of interface states at SiO<sub>2</sub>/Si boundaries on surface photovoltage and piezoelectric photothermal spectra Hiromitsu Hayashi<sup>†</sup>, Takahiro Kuroki, Atsuhiko Fukuyama (Univ. of Miyazaki), Maki Suemitsu (Tohoku Univ.), Tetsuo Ikari (Univ. of Miyazaki)
- P3-40 Nondestructive image evaluation of welded zone of steel plate by photoacoustic microscope Naoki Ohtaki, Mika Hatakeyama<sup>†</sup>, Mamoru Suzuki, Haruo Endoh, Tsutomu Hoshimiya (Tohoku Gakuin Univ.), Masaru Kawakami, Yutaka Muraki, Takeshi Nakajima, Akihide Tominaga, Masami Takeshi (Suzuki Motor Corp.)
- P3-41 Photoacoustic spectroscopy of CdSe quantum dots absorbed on nanostructured TiO<sub>2</sub> electrode Taro Toyoda, Terumasa Uehata<sup>†</sup>, Qing Shen (Univ. Electro-Commun.)
- P3-42 Direct measurement of optical absorption for Si-Ge-Au amorphous thin films by using PAS Hiroaki Takiguchi<sup>†</sup>, Yoichi Okamoto, Atsushi Aruga (National Defense Academy)
- P3-43 Development of millisecond Brillouin spectroscopy Yasuo Minami<sup>†</sup>, Takeshi Yogi, Keiji Sakai (Univ. of Tokyo)
- P3-44 Observation of induced shear acoustic phonons by Brillouin scattering Shigeo Murata<sup>†</sup>, Takayuki Kawamoto, Mami Matsukawa (Doshisha Univ.), Takahiko Yanagitani (AIST)
- P3-45 Reconstruction of vibrating surface of ultrasonic transducer using O-CT and acoustical holography Takeshi Ohbuchi<sup>†</sup>, Shingo Shibata, Koichi Mizutani, Naoto Wakatsuki (Univ. of Tsukuba), Hiroyuki Masuyama (Toba Natl. Coll. Mar. Tech.)
- P3-46 Sonoluminescence and Na-atom emission from SDS surfactant solutions Pak-Kon Choi<sup>†</sup>, Kouta Funayama (Meiji Univ.)
- P3-47 Intensity variation in sonoluminescence by ultrasonic driving conditions Misun Jo<sup>†</sup>, Kwanho Mun, Moojoon Kim, Kanglyeol Ha (Pukyong Univ.), Jungsoon Kim (Tongmyong Univ.)
- P3-48 Test temperature dependence on transesterification of triolein under ultrasonic irradiation condition Hoang Duc Hanh<sup>†</sup>, Nguyen The Dong, Kenji Okitsu, Yasuaki Maeda, Rokuro Nishimura (Osaka Pref. Univ.)
- P3-49 Effect of ultrasound on surfactant aided soil washing for diesel decontamination Jeehyeong Khim, Sunmee Kim<sup>†</sup>, Myunghee Lim, Qiong Yuan, Anna Hwang (Korea Univ.), In-Chul Park, Younguk Kim (Myongji Univ.)
- P3-50 Improvement in the flow rate of a miniature ultrasonic suction pump Takeshi Hasegawa<sup>†</sup>, Daisuke Koyama, Kentaro Nakamura, Sadayuki Ueha (Tokyo Tech.)
- P3-51 A self-running ultrasonic levitated linear guide Daisuke Koyama<sup>†</sup>, Kentaro Nakamura, Sadayuki Ueha (Tokyo Inst. of Tech.)
- P3-52 Development of a cylindrical type ultrasonic motor Yasuyuki Katsube<sup>†</sup>, Kazutaka Honma, Duala (FDK Corp.), Jun Kondoh (Shizuoka Univ.)
- P3-53 An examination of a powder transportation device with groove using ultrasonic vibration Keisuke Okada<sup>†</sup>, Hideyuki Haruna, Yoshikazu Koike (Shibaura Inst. of Tech.)
- P3-54 Nano-tip formation by nickel electroless plating under ultrasonic irradiation Shuji Mononobe<sup>†</sup> (Toyo Univ., Kanagawa Acad. Sci. Tech.)
- P3-55 Extraction of catechins from green tea using ultrasound Hitoshi Koiwai<sup>†</sup>, Nobuyoshi Masuzawa (Musashi Inst. of Tech.)
- P3-56 Influence of high power ultrasonic irradiation on primary nucleation process during solidification Kazumasa Yasuda<sup>†</sup>, Yasuo Saiki, Takashi Kudo, Mamoru Kuwabara, Jian Yang (Nagoya Univ.)
- P3-57 Study of microphone with probe for measuring of high-intensity aerial ultrasonic sound waves Kennichi Komaba<sup>†</sup>, Youichi Ito (Nihon Univ.)
- P3-58 An in-wheel type micro ultrasonic motor using sector-shaped piezoelectric ceramics vibrators Yusuke Matsunaga<sup>†</sup>, Takefumi Kanda, Koichi Suzumori, Takashi Ichihara (Okayama Univ.)
- P3-59 Vibration and welding characteristics of a complex vibration source using a (1,1) transverse vibration disk with 40-mm-diameter bolt-clamped Langevin type PZT transducers Jiromaru Tsujino, Tetsugi Ueoka<sup>†</sup>, Tohru Aoyama, Ryohei Karatsu (Kanagawa Univ.)
- P3-60 Configuration of a 150 kHz ultrasonic welding equipment using a different sound velocity metal-ring-pair complex vibration converter Jiromaru Tsujino, Goh Kishimoto<sup>†</sup> (Kanagawa Univ.)
- P3-61 Configuration of a 20 kHz ultrasonic complex vibration welding system using a transverse vibration welding tip and a complex vibration converter with diagonal slits Jiromaru Tsujino, Ryohei Karatsu<sup>†</sup>, Shun Tanaka, Tetsugi Ueoka (Kanagawa Univ.)
- P3-62 Configuration of ultrasonic motors using different sound velocity metal-ring-pair vibration converters Jiromaru Tsujino, Yuu Kubodera<sup>†</sup>, Akimitsu Hirai (Kanagawa Univ.)

P3-63	Vibration and welding characteristics of a 27 kHz complex vibration source using a (2,1) transverse vibration disk and six bolt-clamped Langevin type PZT transducers	Jiromaru Tsujino, Tohru Aoyama <sup>†</sup> , Ryohei Karatsu, Tetsugi Ueoka (Kanagawa Univ.)
P3-64	Vibration characteristics and dimensions of diagonal slits for a 27 kHz ultrasonics vibration converter	Jiromaru Tsujino, Shun Tanaka <sup>†</sup> , Ryohei Karatsu, Tetsugi Ueoka (Kanagawa Univ.)
P3-65	Vibration and welding characteristics of a 27 kHz complex vibration source using longitudinal vibration disk and six bolt-clamped Langevin type PZT transducers	Jiromaru Tsujino Takafumi Kyuzen <sup>†</sup> , Takaharu Doi, Tetsugi Ueoka (Kanagawa Univ.)
P3-66	A robot finger joint driven by multi-degree-of-freedom ultrasonic actuator	Xiaofeng Zhang <sup>†</sup> , Yasuyuki Gouda, Daisuke Koyama, Kentaro Nakamura, Sadayuki Ueha (Tokyo Inst. of Tech), Masaki Takasan (Toyota Industries Corp.)
P3-67	Gyro-moment motor: Experimental studies of 2-phase-drive-type	Yoshitaka Kimura <sup>†</sup> (Seikoh Giken Co., Ltd.), Yoshiro Tomikawa, Chiharu Kusakabe (Yamagata Univ.), Kouji Matsumoto, Toshio Tokairin (Seikoh Giken Co., Ltd.)
P3-68	Non-contact acoustic manipulation in air	Teruyuki Kozuka <sup>†</sup> , Kyuichi Yasui, Toru Tuziuti, Atsuya Towata, Yasuo Iida (AIST)
P3-69	Application of phase adjuster for improvement in cooling effect of thermoacoustic cooling system	Shin-ichi Sakamoto <sup>†</sup> , Yosuke Imamura, Yoshiaki Watanabe (Doshisha Univ.)
P3-70	Torque characteristics of a ultrasonic motor using a coiled stator	Junichi Tsuchiya <sup>†</sup> , Tadashi Moriya (Tokyo Metropolitan Univ.)
<b>16:15-16:45</b>	<b>Acousto-optics</b>	<b>Chairman : Jun Morimoto (National Defense Academy)</b>
L-1	Application of acoustic optic tunable filter to strain or vibration sensing system	Shinji Tanaka <sup>†</sup> , Kiyokazu Yamada, Hideaki Kobayashi, Michio Kadota (Murata Mfg. Co., Ltd.)
L-2	A piezoelectric photothermal study on carrier behavior at the interface of Si p-n junction	Yuki Uchibori <sup>‡</sup> , Hiroki Chuman, Atsuhiko Fukuyama, Tetsuo Ikari (Univ. of Miyazaki)
<b>16:45-16:50</b>	<b>Break</b>	
<b>16:50-17:20</b>	<b>Sonochemistry</b>	<b>Chairman : Tatsuro Matsuoka (Nagoya Univ.)</b>
M-1	Characterization of ultrasonic transducer for sonochemical reactor by calorimetry	Yoshiyuki Asakura <sup>†</sup> (Honda Electronics, Univ. Nagoya), Tatsuro Matsuoka, Shinobu Koda (Univ. Nagoya)
M-2	Ultrasonic irradiation effects on the fabrication of liposomes in a microchannel	Yasuo Iida <sup>†</sup> , Toru Tuziuti, Kyuichi Yasui, Teruyuki Kozuka, Atsuya Towata (AIST)
<b>17:25</b>	<b>Closing ceremony</b>	