

The 33th Meeting on Ferroelectric Materials and Their Applications (FMA33)

PROGRAM

Wednesday, 25 May

【13:05-13:10】Opening Remark

Tadashi Shiosaki

【13:15-14:45】Ferroelectrics I

Chairperson Seiji Kojima (Univ. of Tsukuba)

- 25-F-01 Nanoscaled Imaging of Linear Permittivity Using SNDM
(Tohoku University) Yoshiomi Hiranaga, Norimichi Chinone, Kotaro Hirose, Yasuo Cho
- 25-F-02 Growth of High-Quality AgNbO₃ Single Crystals and Their Ferrielectric Properties
(The University of Tokyo) Yuuki Kitanaka, Takuya Egawa, Yuji Noguchi, Masaru Miyayama
- 25-F-03 Structural Measurements at High Temperature and Fabrication of Metastable Material by Containerless Processing
(*Hiroshima Univ., **SAGA Light Source) Eisuke Magome*, Kazushi Sumitani**, Toshihiro Okajima**
- 25-F-04 Development of supercritical fluid synthesis with continuous flow system for high crystallinity dielectric ceramic nanoparticles
(Nagoya Inst. Tech.) Teruaki Fuchigami, Ken-ichi Kakimoto
- 25-F-05 Analysis for formation and migration of oxygen vacancies in BaTi_{1-x}MxO₃(M=Zr,Ge)
(*TDK, **JFCC) Yuji Umeda*, Sanshiro Aman*, Akihide Kuwabara**, Hiroki Moriwake**
- 25-F-06 Electro-optic Effect of Barium Titanate Based Relaxors
(Tokyo Inst. of Tech.) Ryuta Yamamoto, Hiroaki Takeda, Takuya Hoshina, Takaaki Tsurumi

【14:45-15:15】Coffee Break

【15:15-16:45】Fundamental I

Chairperson Makoto Iwata (Nagoya Inst. of Tech)

- 25-B-01 First-principles study of Ferroelectricity of AgNbO₃
(JFCC, Shizuoka Univ.*) Hiroki Moriwake, Ayako Konishi, Takafumi Ogawa, Craig A. J. Fisher, Akihide Kuwabara Desheng Fu*
- 25-B-02 X-ray Absorption Spectroscopy on the Electric Field Response of the Valence Bonding States in BaTiO₃
(Hiroshima University) Nobuo Nakajima, Cong Lu, Hiroshi Maruyama
- 25-B-03 Local structure analysis of NaNbO₃ modified by Li
(*JAEA, **Nagoya Inst. of Tech., ***Shizuoka Univ.) Yasuhiro Yoneda*, Rintaro Aoyagi**, Desheng Fu***
- 25-B-04 Ferroelectricity and Crystal Structure of (Sr,Sn)TiO₃
(*Shizuoka Inst. of Scie. & Tech, **Murata Manufacturing Co, Ltd., ***Hiroshima Univ.) Hirofumi Kasatahi*, Kiyoshi Deguchi*, Shoichiro Suzuki*, Akira Ando**, Eisuke Magome***, Chikako Moriyoshi***, Yoshihiro Kuroiwa***
- 25-B-05 Off-centering of Rare-earth Ion in (Ba,R)(Ti,Mg)O₃ (R = Gd, Dy)
(*Hiroshima Univ., *Murata Manufacturing Co., Ltd.) Shoichi Takeda*, Satoshi Yasuda*, Chikako Moriyoshi*, Yoshihiro Kuroiwa*, Atsushi Honda**, Noriyuki Inoue**, Shin'ichi Higai**, Akira Ando*
- 25-B-06 Optical phonons and polaritons of LiNbO₃ studied by far-infrared spectroscopic ellipsometry and Raman scattering
(*Univ. of Tsukuba, **Tokyo Tech.) Seiji Kojima*, Kazuki Kanehara**, Takuya Hoshina**, Takaaki Tsurumi**

【16:45 - 18:00】Thin Films I

Chairperson Kazumi Kato (AIST)

- 25-T-01 Domain structures of K modified NaNbO₃ epitaxial thin films
(Ryukoku University) Ichiro Fujii, Takahiro Wada
- 25-T-02 Preparation of lead-free piezoelectric thin films from precursor solutions by Pechini method
(*Toyama Prefectural Univ., **Toyama Industrial Technology Center) Liqiang Liu*, Tomoaki Karaki*, Tadashi Fujii*, Yuichi Sakai**
- 25-T-03 Properties of Alcohol Related Printer Ink Droplet
(Shibaura Institute of Technology) Yuta Matsuoka, Masaki Yamaguchi, Yoichiro Masuda
- 25-T-04 Direct Deposition of {110}-oriented Perovskite Thin Films on Pt/Si substrates
(National Institute of Technology, Tsuruoka College*, Tokyo Institute of Technology**) Kiyoshi Uchiyama*, Tomoya Sato*, **, Daichi Ichinose**, Junichi Kimura**, Takaaki Inoue*, Takanori Mimura**, Hiroshi Funakubo**
- 25-T-05 Growth and Characterization of AlN Films on SiO₂/Si Substrates with Al₂O₃ Buffer Layers by RF Magnetron Sputtering for Surface Acoustic Wave Applications
(China Univ. of Sci. and Tech., *Tatung Univ.) Kun-Yi Lee, Jia-Ling Wu*, Mu-Shiang Wu*, Wen-Ching Shih**

Thursday, 26 May

【9:00-10:15】Piezoelectric I

Chairperson Masahiko Kimura (Murata Manufacturing Co.,LTD.)

- 26-P-01 Enhancement in piezoelectric properties of $(1-x)\text{Bi}_{0.5}(\text{Na}_{0.8}\text{K}_{0.2})_{0.5}\text{TiO}_3$ - $x\text{BaSnO}_3$ ceramics near morphotropic phase boundary
(Meijo University) Daiki Iida, Hirotaka Ogawa, Susumu Takahashi, Akinori Kan
- 26-P-02 Evaluation of Domain and Grain Boundaries by Elastic Constants in Piezoelectric Single Crystals and Ceramics
(Shizuoka Institute of Science and Technology) Toshio Ogawa, Taiki Ikegaya
- 26-P-03 Orientation Control of (K,Na)NbO₃ Ceramics of Using Platelike NaNbO₃ Templates Synthesized with Mixed Salt
(Department of Materials Science and Engineering, The National Defense Academy) Keisuke Ishii
- 26-P-04 Characterization of piezoelectric properties for $(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3$ - $\text{Ba}_2\text{NaNb}_5\text{O}_{15}$ by means of the Inverse Method
(*Nagoya Inst. Tech., **Friedrich-Alexander-Univ. of Erlangen-Nuremberg) Katsuya Yoshida*, Ken-ichi Kakimoto*, Manuel Weiss**, Stefan J. Rupitsch**, Reinhard Lerch**
- 26-P-05 Investigation of the displacement property and electric reliability of (Li, Na, K)NbO₃ based multilayer piezoceramics
(Taiyo Yuden Co., LTD.)Keiichi Hatano

[10:15-10:30]Coffee Break

【10:30-12:00】Thin Films II

Chairperson Minoru Noda (Kyoto Institute of Technology)

- 26-T-06 Observation of Phase Transition in Ferroelectric Polymer Using Scanning Probe Microscopy
(*Tokyo Univ. Science, **Imoto Mech. Eng., ***Kansai Univ.)Jun Takarada*, Akio Furukawa*, Kenji Imoto**, Shota Saihara***, Yoshiro Tajitsu***
- 26-T-07 Observation of Domain Switching of VDF/TeFE Copolymer Thin Films Using Piezoresponse Force Microscopy
(*Tokyo University of Science, **University of Nebraska-Lincoln) Yuuta Nakagawa*, Yoichiro Hashizume*, Takashi Nakajima*, Alexei Gruverman**, Soichiro Okamura*
- 26-T-08 Fully printed ferroelectric capacitor directed force sensor
(1. Yamagata Univ. ROEL 2. JST PRESTO, 3. Piezotech 4. ARKEMA K. K.) Tomohito Sekine1, Ryo Sugano1, Kenjiro Fukuda1,2, Daisuke Kumaki1, Fabrice Domingues dos Santos3, Atsushi Miyabo4, Shizuo Tokito1
- 26-T-09 Application of Poly (lactic acid) Film Manufactured by Solid-State Extrusion to Bending and Twisting Sensor
(*Mitsui Chemicals Inc., **Kansai University) Mitsunobu Yoshida*,**, Yoshiro Tajitsu**
- 26-T-10 Ultrathin Organic Ferroelectric-gate Field-Effect Transistor
(1. Yamagata Univ. ROEL 2. JST PRESTO, 3. Piezotech 4. ARKEMA K. K.) Ryo Sugano1, Yoshinori Hirai1, Tomohito Sekine1, Kenjiro Fukuda1,2, Daisuke Kumaki1, Fabrice Domingues dos Santos3, Atsushi Miyabo4, Shizuo Tokito1
- 26-T-11 Development of diamond FET with P(VDF-TrFE) gate
(Kanazawa Univ.) Yosuke Mori

[12:00-13:15] Lunch

【13:15-15:30】Special Session --- Barium Titanate ---

- 26-S-01 Thought to the great barium titanate
(Tokyo Tech.) Yukio Sakabe
- 26-S-02 History of physical research on BaTiO₃
(Nagoya Univ.) Yoshihiro Ishibashi
- 26-S-03 Progress on thin-dielectric-layer MLCCs using fine BaTiO₃
(Taiyo Yuden) Hiroshi Kishi
- 26-S-04 Inhomogeneity in Barium Titanate Probed by Angle-Resolved Polarized Raman Scattering
(Shimane Univ.) Shinya Tsukada
- 29-S-05 Lattice-and domain-dynamics, and polarization mechanism BaTiO₃
(Tokyo Tech.) Takuya Hoshina

[15:30-15:45]Coffee Break

[15:45 - 16:30] Plenary Talk

Atomic Structures and Local Chemistry of Oxide Interfaces
(The University of Tokyo) Yuichi Ikuhara

[16:45-17:45] Tutorial

The piezoelectric characteristics of polymer and plastic
(Kansai Univ.) Yoshiro Tajitsu

Friday, 27 May**[9:00-10:15] Dielectrics I**

Chairperson Hajime Nagata (Tokyo University of Science)

- 27-D-01 Crystal structure and microwave dielectric properties of spinel-structured $\text{Li}_{0.5}\text{Ga}_{2.5}\text{O}_4$ ceramics
(Meijo University) Susumu Takahashi, Akinori Kan, Hirotaka Ogawa
- 27-D-02 Electrocaloric Properties of $\text{K}(\text{Ta},\text{Nb})\text{O}_3$ Crystals
(Shonan Institute of Technology) Hiroshi Maiwa
- 27-D-03 Direct Measurements of the Electrocaloric Effect using Thin Film Thermocouple
(Osaka Prefecture University) Yuji Matsushita, Hirotaka Yamashita, Takeshi Yoshimura, Norifumi Fujimura
- 27-D-04 Growth of strontium substituted gehlenite single crystals and characterization of their electrical and mechanical properties
(*Tokyo Inst. Tech., **Kanazawa Univ., *** Univ. Lyon) Hiroaki Takeda*, Kyohei Yoshida*, Hiroki Okudera**, Lebbou Kheirreddine***, Takuya Hoshina* and Takaaki Tsurumi*
- 27-D-05 Time-resolved Crystal Structure Analysis of Resonantly Vibrating Langasite Oscillator
(*Nagoya City Univ., **JASRI, ***Hiroshima Univ.) Shinobu Aoyagi*, Hitoshi Osawa**, Kuniyoshi Sugimoto**, Shoichi Takeda***, Chikako Moriyoshi***, Yoshihiro Kuroiwa***

[10:15-10:30] Coffee Break

[10:30-12:00] Thin Films III

Chairperson Hironori Fujisawa (Univ. of Hyogo)

- 27-T-12 Composition dependence of electrical properties and crystal structure for the epitaxial PZT thin films grown on Si and SrTiO_3 substrates
(*Tokyo Inst. Tech., **kanagawa Industrial Technology Center) Shoji Okamoto*, Satoshi Okamoto*, Shintaro Yokoyama*, Hiroshi Funakubo*, Kensuke Akiyama**
- 27-T-13 Influence of charge screening at interface of tetragonal/rhombohedral $\text{Pb}(\text{Zr}_{1-x}\text{Ti}_x)\text{O}_3$ artificial superlattice thin films on the piezoelectric property
(*Nagoya Univ., **NIMS, ***Tokyo Tech., ****BrukerAXS, *****Tohoku Univ.) Tomoaki Yamada*, Youhei Ebihara*, Osami Sakata**,***, Hitoshi Morioka****, Takanori Kiguchi*****, Takao Shimizu***, Hiroshi Funakubo***, Masahito Yoshino*, Takanori Nagasaki*
- 27-T-14 Structure change of continuously strain controlled $\text{Pb}(\text{Zr}, \text{Ti})\text{O}_3$ films by $\text{Zr}/(\text{Zr}+\text{Ti})$ ratio
(*Tokyo Tech, **TU Darmstadt,***NIMS, ****SPRING8, ***Nagoya Univ., 6PRESTO) Daichi Ichinose*, Takaaki Nakashima*, Yoshitaka Ehara*,**, Takahiro Oikawa*, Takao Shimizu*, Osami Sakata*,****,*****, Tomoaki Yamada*****,*****, Hiroshi Funakubo*
- 27-T-15 Breakdown voltage and piezoelectric fatigue of $\text{Pb}(\text{Zr}, \text{Ti})\text{O}_3$ thin film
(Silicon Sensing Products Ltd.) Yusuke Tabuchi, Takashi Ikeda, Gen Matsuoka
- 27-T-16 Design and fabrication of a MEMS optical scanner device considering deformation caused by internal stress
(AIST1, Kyushu University2, JST-CREST3) T. Takeshita1,2, R. Sawada2, N. Makimoto1,3, T. Kobayashi1,3
- 27-T-17 Wireless sensing module using piezoelectric vibration energy harvester
(*AIST, *Tokyo university) Ryohei Takei*, Natsumi Makimoto*, Hironao Okada*, Toshihiro Itoh*,**, Takeshi Kobayashi*

[12:00-13:15] Lunch

[13:15 - 14:45] Fundamental II

Chairperson Shinya Tsukada (Tottori Univ.)

- 27-B-07 Domain and Defect Structures in the ferroelectric phase of $\text{Ba}_{1-x}\text{Sr}_x\text{Al}_2\text{O}_4$ ($0.7 < x < 1.0$)
(Osaka Prefecture University) Hirofumi Tsukasaki, Eri Tanaka, Yui Ishii, Shigeo Mori, Shogo Kawaguchi
- 27-B-08 Broadband Light-scattering on Fractal and Non-fractal Relaxors
(Ritsumeikan University) Akitoshi Koreeda

- 27-B-09 Angular dependence of Raman spectrum for Pb(Zr,Ti)O₃ epitaxial films
(*Nat. Def. Acad, **Tokyo Inst. Tech., Sophia Univ.) Hiroaki Fukushima*, Hiroshi Funakubo**, Hiroshi Uchida***, Hiromi Shima*, Ken Nishida*
- 27-B-10 Field Dependent Elastic Anomaly in Uniaxial Tungsten Bronze Relaxors
(Univ. of Tsukuba, *Univ. of Silesia, **Duisburg-Essen Univ.) M. Aftabuzzaman, J. Dec*, W. Kleemann**, S. Kojima
- 27-B-11 Ferroelectric phase transition of NaVO₃ investigated by broadband micro light scattering spectroscopy
(*Ritsumeikan Univ., **Nagoya Univ.) Yasuhiro Fujii*, Daisuke Katayama*, Mitsuyoshi Morita*, Akitoshi Koreeda*, Hiroki Taniguchi**, Ichiro Terasaki**
- 27-B-12 Nonlinear dielectric susceptibility in relaxor Pb(Zn_{1/3}Nb_{2/3})O₃-PbTiO₃
(*Nagoya Inst. of Tech., **Nagoya Univ.) Makoto Iwata*, Kenta Ninoseki*, Ryo Nagahashi*, Yoshihiro Ishibashi**

[14:45-15:00] Coffee Break

[15:00 - 16:45] Thin Films IV

Chairperson Masaki Azuma(Tokyo Inst. of Tech)

- 27-T-18 Influence of (Bi_{1/2}Na_{1/2})TiO₃ in the electrical properties of BiFeO₃-based thin films
(Osaka Prefecture University) JinHong Choi, Takeshi Yoshimura, Norifumi Fujimura
- 27-T-19 Ferromagnetism in BiFe_{1-x}CoxO₃ thin films and the correlation between ferroelectric and ferromagnetic domains
(*Tokyo Inst. of Tech., **Nagoya Inst. of Techn.) H. Hojo*, R. Kawabe*, H. Yamamoto*, K. Mibu**, M. Azuma*
- 27-T-20 In-situ Observation of a Lattice Distortion in an Epitaxial BiFeO₃ Thin Film under an Electric Field
(*Univ. of Hyogo, **NIMS, ***Tokyo Inst. of Tech., ****JASRI/SPRING-8) S. Nakashima*, O. Sakata**, H. Funakubo***, K. Takayama*, H. Fujisawa*, T. Shimizu***, D. Ichinose***, Y. Imai****, M. Shimizu*
- 27-T-21 Influence of Transition Metal Element Doping on Anomalous Photovoltaic Effects in Single-Domain BiFeO₃ Thin Films
(University of Hyogo) Kota Takayama, Seiji Nakashima, Hironori Fujisawa, Masaru Shimizu
- 27-T-22 Fabrication and photo-induced properties of Ag nanoparticles-BiFeO₃ composite thin films by chemical solution deposition
(*Nagoya Univ., **Waseda Univ.) Rika Maruyama*, Wataru Sakamoto*, Toshinobu Yogo*, Koichirou Hayashi*, Isamu Yuitoh**, Teruaki Takeuchi**
- 27-T-23 Piezoelectric property of BiFeO₃ thick films fabricated by rf magnetron sputtering system
(Osaka Prefecture Univ.*, TRI Osaka **) M. Aramaki*, K. Kariya*, T. Yoshimura*, S. Murakami**, N. Fujimura*
- 27-T-24 Growth, and Magnetic and Structural Properties of Multiferroic Fe₃O₄/BNEuT Composite Thin Films
(University of Hyogo) Masafumi Kobune, Ryosuke Furotani, Satoshi Fujita, Kazuki Kikuchi, Tomoyuki Kuriyama, Takeyuki Kikuchi, Hironori Fujisawa, Masaru Shimizu, Naoki Fukumuro

[16:45-17:00] International Award

[17:00-17:45] Invited Talk

PZT PiezoMENS with integrated Electronics

(The Penn State Univ.) M. Wallace, J. I. Ramirez, T. N. Jackson, and S. Trolor-McKinstry

Saturday 28 May

[9:00-10:15] Ferroelectric II

Chairperson Kenichi Kakimoto (Nagoya Inst. of Tech)

- 28-F-07 Development of ferroelectric SEIs for Li ion batteries with high charge—discharge rate capability
(*Okayama Univ.) Takashi Teranishi*, Yumi Yoshikawa*, Hidetaka Hayashi*, Akira Kishimoto*
- 28-F-08 Thermoelectric property of hexagonal BaTiO₃
(Tokyo Inst. of Tech.) Shintaro Yasui, Yusuke Ishimoto, Tomoyasu Taniyama, Mitsuru Itoh, Takao Shimizu
- 28-F-09 Fabrication of BaTi₂O₅ Semiconducting Ceramics by Yttrium Addition
(The National Defense Academy) Shinjiro Tashiro, Keisuke Ishii
- 28-F-10 Quenching Effects for Electrical Properties of (Bi_{0.5}Na_{0.5})TiO₃ Ceramics
(Tokyo University of Science) Hiroki Muramatsu, Hajime Nagata, Tadashi Takenaka
- 28-F-11 The core-shell structure and dielectric properties of (K_{0.5}Na_{0.5})NbO₃-SrZrO₃, the ceramics indicating suitable characteristics for high temperature capacitors
(TDK Corporation) Sanshiro Aman, Keiko Kubo, Hiroki Akiba and Daisuke Iwanaga

[10:15-10:30]Coffee Break

【10:30-12:00】 Thin Films V

Chairperson Jun Akedo (AIST)

- 28-T-25 Orientation Control of Barium Titanate Films using Metal-oxide Nanosheet Layer
(*Sophia Univ., **Nat. Def. Acad., ***Tohoku Univ., ****Tokyo Tech.) T. Oi*, K. Noguchi*, S. Moki*, J.-W. Kim**, H. Shima**, K. Nishida**, T. Kiguchi***, A. Akama***, T. J. Konno***, H. Funakubo****, H. Uchida*
- 28-T-26 Fabrication and characterization of BaTiO₃ epitaxial thin films
(University of Tokyo) Hisashi Maki, Yuji Noguchi, Masaru Miyayama
- 28-T-27 Fabrication and dielectric properties of barium titanate based solid solution nanocube assembly films
(AIST) Ken-ichi Mimura, Qiang Ma, Kazumi Kato
- 28-T-28 Improvement in the resistive hysteresis characteristics of BaTiO₃ thin film for ReRAM by layer-by-layer annealing process
(Kyoto Institute of Technology) Toshiyuki Sugie, Shuhei Hashimoto, Sou Maejima, Kaoru Yamashita, Minoru Noda
- 28-T-29 Pulse laser growth of tetragonal (Bi,K)TiO₃ epitaxial films and their piezoelectric properties
(*Tokyo Tech., *Sophia Univ.) Yuichi Nemoto, Daichi Ichinose, Takao Shimizu*, Hiroshi Uchida**, Hiroshi Funakubo*
- 28-T-30 Influence of substrate on piezoelectric property of BaTiO₃ films deposited by AD method
(Research Institute for Electromagnetic Materials) Yoshihiro Kawakami

[12:00-] Closing Remarks