

May 30 (Wed)

Opening Remarks Akira Kawabata (Chairperson) 10:25

Ferroelectric Materials (I) Chairs: T. Hayashi (Shonan Inst. of Tech.) 10:30—12:00

(30-F-1) On the Solid Solution of Mn Ion in Barium Titanate

A. Kiriyanov, N. Ozaki, H. Ohsato, N. Kohzu and H. Kishi  
(Nagoya Inst. of Tech. and \*Taiyo Yuden Co.)

(30-F-2) Poling Field Dependence of Ferroelectric Properties in Barium Titanate Ceramics

T. Ogawa (Sizuoka Inst. of Sci. and Tech.)

(30-F-3) Dielectric Properties of  $\text{Ba}_6\text{Ti}_2\text{Nb}_8\text{O}_{30}$  Ferroelectric Ceramics

K. Yoshida, K. Kanai, M. Sawazaki and J. Shirafuji  
(Fukui Univ. of Tech.)

(30-F-4) Influence of Electrode Materials on PLZT Powder with Heating under Reduced Atmosphere

M. Kondo, K. Maruyama and K. Kurihara  
(Fujitsu Lab. Ltd.)

(30-F-5) Crystal Growth and Dielectric Properties of Solid Solutions of  $\text{Pb}(\text{Yb}_{1/2}\text{Nb}_{1/2})\text{O}_3$ - $\text{PbTiO}_3$  with a High Curie Temperature near a Morphotropic Phase Boundary

N. Yasuda, H. Ohwa, M. Kume, H. Hosono\*, Y. Yamashita\*,  
S. Ishino\*\*, H. Terauchi\*\*, M. Iwata\*\*\* and Y. Ishibashi\*\*\*\*  
(Gifu Univ., \*Toshiba Co., \*\*Kanseigakuin Univ.,  
\*\*\*Nagaya Univ. and \*\*\*\*Aichi Shukutoku Univ.)

(30-F-6) Ferroelectric Properties of  $(\text{Ag}, \text{Li})(\text{Nb}, \text{Ta})\text{O}_3$  Ceramics

Y. Sakabe, T. Takeda, Y. Ogiso and N. Wada  
(Murata Manufacturing Co.)

Thin Films (I) Chairs: K. Abe (Toshiba Co.) 13:15--14:45

(30-T-1) Crystal Structure and Electric Property of (001)-Epitaxial  $\text{SrTiO}_3$  Films on  $\text{CeO}_2/\text{YSZ}/\text{Si}(001)$  by the Control of First Atomic Layer for MFIS-FETs

T. Yamada, H. Ishigaki, N. Wakiya, K. Shinozaki and N. Mizutani  
(Tokyo Inst. Of Tech.)

(30-T-2) Ir Film Deposition on an Epitaxial  $(100)\text{ZrN}/(100)\text{Si}$  Substrate Treated by  $\text{HF}+$  Hydrazine

S. Horii, T. Toda and S. Horita  
(Japan Advanced Inst. of Tech.)

(30-T-3) Diagnostics of Oxidation Reaction in MOCVD of  $(\text{Ba}, \text{Sr})\text{TiO}_3$  Films by in situ FT-IR Spectroscopy

S. Momose, R. Sahara, T. Nakamura and K. Tachibana  
(Kyoto Univ.)

(30-T-4) The Effect of Supply Oxygen Gas on the Reaction Mechanisms in Liquid Source CVD of (Ba,Sr)TiO<sub>3</sub> Thin Films

M. Yamamuka, T. Kawahara, T. Oomori and H. Takada  
(Mitsubishi Elec. Co.)

(30-T-5) Electrical Properties of Mg Doped [Ba<sub>0.5</sub>Sr<sub>0.5</sub>]TiO<sub>3</sub> Thin Films

K. H. Yoon, J. C. Lee and J. Park  
(Yonsei Univ.)

(30-T-6) Effects on Seed Layers on Tunability/Loss of Ba<sub>0.5</sub>Sr<sub>0.5</sub>TiO<sub>3</sub> Capacitors for Voltage Tunable Devices

Y. A. Jeon and S. G. Yoon  
(Chungnam Nat'l Univ.)

Piezoelectric Materials (I) Chairs: M. Adachi (Toyama Pref. Univ.)

15:00--16:15

(30-P-1) Properties of PZT Ceramics Manufactured Using Hybrid Sintering Process

H. Takahashi, K. Kato, J. Qiu\*, J. Tani\* and K. Nagata\*\*  
(Fuji Ceramics Co., \*Tohoku Univ. and \*\*National Defence Academy)

(30-P-2) Preparation of PZT Thick Films by Arc-discharged Ion-Plating Method

Y. Yasuda, M. Akamatsu, M. Tani, M. Yoshida, K. Kondo and T. Iijima\*  
(Stanley Elec. Co. and \*AIST)

(30-P-3) Preparation of Ferroelectric Thin Film Actuator on Silicon Substrate by Screen Printing

T. Futakuchi, H. Yamano\* and M. Adachi\*  
(Toyama Ind. Tech. Center and \*Toyama Pref. Univ.)

(30-P-4) Preparation of Texture Lead Zirconate Titanate Diaphragm Type Film Actuator Using Chemical Solution Method

T. Iijima, B. P. Zhang and K. Kunii\*  
(Nat'l Inst. of Advanced Ind. Sci. and Tech. and \*NIDEC COPAL Co.)

(30-P-5) Temperature Dependence of Piezoelectric Properties of Grain Oriented CaBi<sub>4</sub>Ti<sub>4</sub>O<sub>15</sub> Ceramics

H. Ogawa, M. Kimura, A. Ando and Y. Sakabe  
(Murata Manufacturing Co.)

Thin Films (II)

Chairs: Y. Miyasaka (NEC)

16:30--18:00

(30-T-7) Influence of the Gas Effects on the Electrical and Optical Properties of PZT Thin Films Prepared by Aerosol Deposition Method

J. Akedo and M. Lebedev  
(A. I. S. T.)

(30-T-8) Low Temperature Crystallization of Sol-Gel Derived Pb(Zr,Ti)O<sub>3</sub> Thin Films

K. Maki, N. Soyama, K. Nagamine, S. Mori and K. Ogi  
(Mitsubishi Material Co.)

(30-T-9) Electrical Properties of Antiferroelectric  $\text{PbZrO}_3$  Thin Films Prepared by Chemical Solution Deposition

H. Maiwa and N. Ichinose\*  
(Shonan Inst. of Tech. and \*Waseda Univ.)

(30-T-10) Preparation and Characterization of Ta Substituted  $(\text{Sr,Ba})\text{Nb}_2\text{O}_6$  Thin Films by Chemical Solution Deposition Method

W. Sakamoto, Y. Horie, T. Yogo and S. Hirano  
(Nagaya Univ.)

(30-T-11) Preparation of PZT Thin Film by Sol-gel Hydrothermal Method at Low Temperature

Z. Wei, H. Xu, K. Yamashita, M. Noda and M. Okuyama  
(Osaka Univ.)

(30-T-12) Sol-Gel Derived Ferroelectric  $\text{Pb}(\text{Zr}_{1-x}\text{Ti}_x)\text{O}_3\text{-SiO}_2\text{-B}_2\text{O}_3$  Glass-Ceramic Thin Films at Relatively Low Annealing Temperatures

X. Wang and H. Ishiwara  
(Tokyo Inst. of Tech.)

May 31 (Thu)

Thin Films (III)

Chairs: M. Shimizu (Himeji Inst. of Tech.)

9:00--10:15

(31-T-13) Effects of Mn Dopant on the Leakage Current Properties in  $\text{SrTiO}_3$  Thin Films

K. Morito, M. Suzuki and M. Fujimoto  
(Taiyo Yuden Co.)

(31-T-14) New Concept of Fatigue Model Based on Thermionic Field Emission

M. Tajiri and H. Nozawa  
(Kyoto Univ.)

(31-T-15) Observation of Piezoelectric Relaxation in Ferroelectric Thin Films by Continuous Charge Integration

D. S. Fu, K. Ishikawa and H. Suzuki  
(Shizuoka Univ.)

(31-T-16) Ferroelectric and Pyroelectric Properties of Ba and Ti-site Substituted  $\text{BaTiO}_3$  Materials

H. Kakimoto, K. Kakimoto\*, S. Fujita\*\* and Y. Masuda\*\*  
(Tokyo Inst. of Tech., \*Nagoya Inst. of Tech. and \*\*Hachinohe Inst. of Tech.)

(31-T-17) Preparation and Crystal Evaluation of a New Piezoelectric  $\text{Ta}_2\text{O}_5$  Thin Film

Y. Nakagawa, T. Igarashi and N. Tutiya  
(Yamanashi Univ.)

Thin Films (IV)

Chairs: H. Tabata ( Osaka Univ. )

10:30 –12:00

(31-T-18) Low Temperature Fabrication of  $\text{Ir/Pb}(\text{Zr,Ti})\text{O}_3/\text{Ir}$  Capacitors only by MOCVD

H. Fujisawa, K. Kita, Masaru Shimizu and H. Niu

(Himeji Inst. of Tech.)

(31-T-19) Fabrication of Ferroelectric  $\text{Pb}(\text{Zr,Ti})\text{O}_3$  Thin Films by Liquid Delivery MOCVD

M. Miyake, K. Lee, S. Kawasaki, Y. Ueda, S. Okamura and T. Shiosaki

(Nara Inst. of Sci. and Tech.)

(31-T-20) Preparation and Characterization of the Electrode Films by MOCVD Method

Y. Takayama, H. Uchida and K. Ogi

(Mitsubishi Material Co.)

(31-T-21) Recycle of MOCVD Source and Influence of Organic Impurities

K. Okamoto, H. Suzuki, M. Saito, J. Taniuchi, M. Kurita and K. Kitada

(Tanaka Kikinzoku Kogyo)

(31-T-22) Growth of Pt, Ru and  $\text{RuO}_2$  Films Obtained by Metal-Organic Chemical Vapour Deposition

-- Optimization of Process Conditions by Thermodynamic Calculations--

J. Lindner, P. K. Baumann, M. Schumacher, D. Burgess, F. Schienle,

H. Juergensen, K. Frohlich\*, D. Machajdik\*, V. Cambel\*, A. Pisch\*\*, P. Doppelt\*\*\*

(AIXTRON, \*Inst. of Electrical Eng. Slovak, \*\*LTPCM, \*\*\*ESPCI)

(31-T-23) Structural and Electrical Properties of PZT Thin Films Prepared by MOCVD Using Ultrasonic Nebulization

C. H. Lee and H. S. Shin

(Keimyung Univ.)

Ferroelectric Materials (II) Chairs: Y. Sakabe (Murata Manufacturing Co.)

13:15--14:45

(31-F-7) Growth and Characterization of Ferroelectric  $\text{Bi}_{4-x}\text{La}_x\text{Ti}_3\text{O}_{12}$  Crystals

R. Aoyagi, K. Komagata, H. Takeda, S. Okamura and T. Shiosaki

(Nara Inst. of Sci. and Tech.)

(31-F-8) Degree of Crystallization and Contamination Effect on Ferroelectric Ceramics Powder by Fine Grinding Technology

M. Munekata, O. Kamata, T. Shirasaka and T. Higuchi\*

(Japan Sci. and Tech. Co., and \*Univ. of Tokyo)

(31-F-9) New Lead-free Ferroelectric Ceramics with High and Broad Dielectric Response

-- Synthesis and Dielectric Properties of  $\text{Ba}_{1-x}\text{La}_x\text{Ti}_{1-x}\text{Cr}_x\text{O}_3$  --

G. Li, M. Fukunaga, Y. Uesu and K. Kohn

(Waseda Univ.)

(31-F-10) The Dielectric Properties and Phase Transition of  $(1-x)\text{Pb}(\text{Yb}_{1/2}\text{Ta}_{1/2})\text{O}_{3-x}\text{Pb}(\text{Yb}_{1/2}\text{Nb}_{1/2})\text{O}_3$

H. J. Kim, J. H. Lee and W. K. Choo

(KAIST)

(31-F-11) Growth of High Quality  $\text{ReMnO}_3$  (Re:Lanthanide) Single Crystals

N. T. Cho, D. H. Kwon, K. B. Shim, I. Tanaka\* and K. H. Auh

(Hanyang Univ. and \*Yamanashi Univ.)

(31-F-12) Neutron, Electrical, and Magnetic Investigations of  $\text{PbFeO}_3$ - $\text{PbTiO}_3$  System

J. S. Kim, C. Cheon, H. S. Shim\* and P. W. Jang\*\*

(Hoseo Univ., \*KAERI, \*\*Chongju Univ.)

Thin Films (V)

Chairs: T. Shiosaki (Nara Inst. of Sci. and Tech.)

15:00--16:15

(31-T-24) Stoichiometry and Piezoelectric Response of YAG-PLD Derived Ferroelectric PZT Thin Film

K. Kakimoto, H. Kakemoto\*, S. Fujita\*\* and Y. Masuda\*\*

(Nagoya Inst. of Tech., \*Tokyo Inst. of Tech. and \*\*Hachinohe Inst. of Tech.)

(31-T-25) Microstructure and Electrical Properties of PZT Thin Films Deposited by Excimer Laser

Z. J. Wang, R. Maeda\*, M. Ichiki\* and H. Kokawa

(Tohoku Univ. and \*Mechanical Eng. Lab.)

(31-T-26) Observation of Microstructure and Electrical Properties of Films Crystallized from Amorphous  $(\text{Pb},\text{La})(\text{Zr},\text{Ti})\text{O}_3$  by Two Step Post Deposition Annealing

M. Kobune, O. Matsuura, T. Matsuzaki, T. Sawada, A. Minishige,

H. Fujisawa, M. Shimizu, H. Niu and K. Honda\*

(Himeji Inst. of Tech. and \*Fujitsu Lab. Ltd.)

(31-T-27) Ferroelectricity in Li-doped  $\text{ZnO}:\text{X}$  Thin Films and the Application for the Optical Switching Devices

T. Nagata, T. Shimura, A. Ashida, N. Fujimura and T. Ito

(Osaka Pref. Univ.)

(31-T-28) Influence of Annealing Conditions on the Structure and Ferroelectric Properties of PZT Thin Films Prepared by RF-Magnetron Sputtering

R. Thomas, S. Mochizuki, T. Mihara and T. Ishida

(Osaka National Research Institute)

Special Talk

Chairs: Y. Ishibashi (Aichi Shukutoku Univ.)

16:30--17:30

(31-I-1) Looking back upon the Days of Discovery of Oxide Ferroelectrics and Antiferroelectrics

E. Sawaguchi, S. Fujishima and A. Kawabata

(Agune Gijutsu Center, Murata Mfg. and Toyama Pref. Univ.)

June, 1 (Fri) Parallel session (Room 202)

Piezoelectric Materials (II) Chairs: T. Tsurumi (Tokyo Inst. of Tech.)

9:00--10:15

(1-P-6) Piezoelectric Properties of  $\text{Bi}_3\text{TiNbO}_9$ - $\text{BaBi}_2\text{Nb}_2\text{O}_9$  Based Ceramics

M. Nanao, M. Hirose and T. Tsukada

(TDK Co.)

- (1-P-7)  $\text{Sr}_{1-x}\text{Ca}_x\text{Bi}_2\text{Ta}_2\text{O}_9$  Piezoelectric Ceramics with High Mechanical Quality Factor  
K. Shibata, K. Shoji and K. Sakata\*  
(Ashikaga Inst. of Tech. and \*Sci. Univ. Tokyo)
- (1-P-8) Lead-free Piezoelectric Ceramics Containing  $(\text{Na}_{0.5}\text{Bi}_{0.5})\text{TiO}_3$  or  $(\text{K}_{0.5}\text{Bi}_{0.5})\text{TiO}_3$  as Main Component  
K. Toyoiike, Y. Imanaka, Y. Matsuo and T. Wada  
(Ryukoku Univ.)
- (1-P-9) Crystal Growth of NBT-BT Binary Single Crystal and Their Electrical Properties  
Y. Hosono, K. Harada and Y. Yamashita  
(Toshiba Co.)
- (1-P-10) Morphotropic Phase Boundary and Piezoelectric Properties of  $(\text{Bi}_{1/2}\text{Na}_{1/2})\text{TiO}_3$ - $\text{KNbO}_3$  Ceramics  
H. Isii, H. Nagata and T. Takenaka  
(Sci. Univ. of Tokyo)
- Piezoelectric Materials (III) Chairs: Y. Masuda (Hachinohe Inst. of Tech.) 10:30--12:00
- (1-P-11) Poling Treatment and Piezoelectric Properties of Potassium Niobate Ferroelectric Single  
S. Wada, A. Seike and T. Tsurumi  
(Tokyo Inst. of Tech.)
- (1-P-12) Study of Electrode Material Effect on NSPUDT Properties of Langasite  
S. Q. Wang, R. Kimura, K. Yamaguchi, J. Harada, S. Uda and K. Hasegawa\*  
(Mitsubishi Material Co. and \*Muroran Inst. of Tech.)
- (1-P-13) Measurement of Complex Materials Constants of Piezoelectrics  
-- Extensional Vibrational Mode of a Rectangular Bar --  
H. Hashimoto, M. Maeda and I. Suzuki  
(Nagoya Inst. of Tech.)
- (1-P-14) Grain Size Dependence of Third Nonlinear Piezoelectric Coefficient  
S. Tashiro, T. Murata, K. Ishii and S. Igarashi  
(National Defense Academy)
- (1-P-15) Large Vibration Amplitude Characteristics of Hydrothermally Deposited PZT Thin Film Transducers  
T. Kanda, Y. Kobayashi\*, M. Kurosawa\*, H. Yasui, T. Higuchi  
(The Univ. of Tokyo, and \*Tokyo Inst. of Tech.)
- (1-P-16) High Power Characteristics of Multilayer Piezoelectric Ceramic Transducers  
Y. Sasaki, S. Takahashi, M. Yamamoto, A. Ochi, T. Inoue and M. Umeda\*  
(NEC and \*Nagaoka Nat'l College of Tech.)

Thin films (VI)

Chairs: E. Tokuknaga (Tokyo Inst. of Tech.)

13:15--14:45

- (1-T-29) Ferroelectric Properties of Alkoxy-Derived  $\text{MBi}_4\text{Ti}_4\text{O}_{15}$  (M:Alkaline Earth Metals) Thin Films  
K. Kato\*, K. Suzuki, K. Nishizawa and T. Miki  
(National Inst. of Adv. Ind. Sci. and Tech. and \*Tokyo Inst. of Tech.)
- (1-T-30) Preparation and Properties of  $\text{SrBi}_2\text{Ta}_2\text{O}_9$  Ferroelectric Thin Films Using Excimer Irradiation  
T. Hayashi and D. Togawa  
(Shonan Inst. of Tech.)
- (1-T-31) Local-epitaxial Growth of (1,0,m+1)mono-oriented of BLSF Thin Films Prepared at Low Temperature and Its Properties  
N. Nukaga, M. Mitsuya, T. Suzuki\*, Y. Nishi\*, M. Fujimoto and H. Funakubo  
(Tokyo Inst. of Tech. and \*Taiyo Yuden Co.)
- (1-T-32) Characterization of Pulse Switching Behavior of Pt/ $\text{SrBi}_2\text{Ta}_2\text{O}_9$ /Pt Capacitors in FeRAM  
C. H. Chung, S. H. Oh, B. Yang, Y. M. Kang,  
S. S. Lee, S. K. Hong, N. S. Kang and H. K. Yoon  
(Hyundai Elec. Co.)
- (1-T-33) Potential  $(\text{Bi},\text{La})_4\text{Ti}_3\text{O}_{12}$  (BLT) Thin Film Prepared by Low Temperature Process for Ferroelectric Random Access Memory (FeRAM)  
W. S. Yang, N. K. Kim, S. J. Yeom, S. Y. Kweon, E. S. Choi and J. S. Roh  
(Hyundai Elec. Co.)
- (1-T-34) BLT  $(\text{Bi}_{3.3}\text{La}_{0.8}\text{Ti}_3\text{O}_{12})$  Etching in Ar/ $\text{Cl}_2$  Mixed High Density Plasma  
J. H. Cho, Y. S. Cho, D. S. Kim, J. W. Kim and H. K. Yoon  
(Hyundai Elec. Co.)

Thin films (VII)

Chairs: N. Fujimura (Osaka Pref. Univ.)

15:00--16:00

- (1-T-35) Improvement Effect of Si- $\text{Bi}_4\text{Ti}_3\text{O}_{12}$  Interface Properties due to the Insertion of an Ultrathin Silicon Oxynitride Buffer  
E. Rokuta, J. H. Choi, Y. Hotta, H. Tabata, H. Kobayashi and T. Kawai  
(Osaka Univ.)
- (1-T-36) Preparation of  $\text{Bi}_4\text{Ti}_3\text{O}_{12}/\text{Bi}_2\text{SiO}_5/\text{Si}$  Structures Derived by Metal Organic Decomposition Technique  
M. Yamaguchi, T. Nagatomo and Y. Masuda\*  
(Shibaura Inst. of Tech. and \*Hachinohe Inst. of Tech.)
- (1-T-37) Fabrication and Characterization of MFMIS Structure using Ferroelectric  $(\text{Ba},\text{La})_4\text{Ti}_3\text{O}_{12}$  Films  
E. Tokumitsu, T. Isobe, T. Kijima and H. Ishiwara  
(Tokyo Inst. of Tech.)

(1-T-38) Effects of Bi Content on Electrical Properties of Pt/SrBi<sub>2</sub>Nb<sub>2</sub>O<sub>9</sub>/Si Ferroelectric Gate

I. H. Choi, H. S. Choi, J. S. Zhao, Y. T. Kim\* and S. I. Kim\*

(Korea Univ. and \*KIST)

Microwave Materials

Chairs: K. Wakino (Murata Manufacturing Co.)

16:15--17:15

(1-M-1) Microstructure and Electrical Properties of Ni-MLCC with Various Kinds of Rare Earth Oxide

K. Chazono and H. Kishi

(Taiyo Yuden Co.)

(1-M-2) Crystal Structure and Microwave Dielectric Properties of Yb<sub>2</sub>Ba(Cu<sub>1-x</sub>M<sub>x</sub>)O<sub>5</sub> (M=Zn and Ni) Solid Solutions

A. Kan, H. Ogawa, R. Yokoi and H. Ohsato\*

(Meijyo Univ. and \*Nagoya Inst. of Tech.)

(1-M-3) Microwave Dielectric Properties of Ba<sub>n</sub>La<sub>4</sub>Ti<sub>3+n</sub>O<sub>12+3n</sub> Homologous Series.

K. Kiuchi, T. Okawa\*, H. Okabe\* and H. Ohsato

(Nagoya Inst. of Tech. and \*Daiken Chem. Co.)

(1-M-4) Low Temperature Sintering and Microwave Dielectric Properties of Ca(Li<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3-δ</sub> Ceramics

P. Liu, E. S. Kim, K. G. Lee, S. G. Kang and K. H. Yoon\*

(Kyonggi Univ. and \*Yonsei Univ.)

Parallel session (Room 201)

Fundamentals (I)

Chairs:T.Yamamoto (National Defence Academy)

9:00--10:15

(1-B-1) Raman Scattering in the (1-x)Pb(Zn<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3-x</sub>PbTiO<sub>3</sub> Mixed Crystal System (II)

M. Iwata, N. Tomisato, H. Orihara, N. Arai,

N. Tanaka, H. Ohwa\*, N. Yasuda\* and Y. Ishibashi\*\*

(Nagoya Univ., \*Gifu Univ and \*\*Aichi Shukutoku Univ.)

(1-B-2) Cation Distribution and Ferroelectric Phase Transition of La-Substituted Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub> Investigated by Raman Spectroscopy

M. Nagata, M. Tada\*, M. Kakihana\*, T. Watanabe\* and H. Funakubo\*

(RIKEN, \*Tokyo Inst. of Tech.)

(1-B-3) Dielectric Properties of Crystallization Process from Amorphous Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub>

M. Takashige, S. Hamazaki, R. Yoshida, F. Shimizu,

T. Yamaguchi\*, S. Kojima\*\* and M. S. Jang\*\*\*

(Iwaki Meisei Univ., \*Meisei Univ., \*\*Tsukuba Univ. and \*\*\*Pusan Univ.)

(1-B-4) Phase Transition Studies of Pb(Zr<sub>x</sub>Ti<sub>1-x</sub>)O<sub>3</sub> Ceramics

J. Frantti, S. Ivanov\*, S. Eriksson\*\*, J. Lappalainen\*\*\*, V. Lantto\*\*\* and M. Kakihana



(Tokyo Inst. of Tech., \*Karpov Inst. of Phys. Chem., \*\*Uppsala Univ. and \*\*\*Univ. of Oulu)

- (1-B-5) Dynamical Properties of Relaxor Ferroelectrics  $\text{Pb}(\text{Sc}_{1/2}\text{Ta}_{1/2})\text{O}_3$   
F. Jiang, J-H Ko, S. Kojima and S. Lushnikov\*  
(Univ. of Tsukuba and \*Loffe Tech. Inst.)

Fundamentals (II)                      Chairs: Y. Uesu (Waseda Univ.)                      10:30--12:00

- (1-B-6) Electronic Structure of  $\text{Bi}_4\text{Ti}_3\text{O}_{12}$  Thin Film by Soft-x-ray Emission Spectroscopy  
T. Higuchi, M. Tanaka, K. Kudoh, T. Takeuchi, T. Tsukamoto, Y. Harada\* and S. Shin\*  
(Sci. Univ. of Tokyo, \*RIKEN)
- (1-B-7) Relation between Lattice Deformation and Polarization in  $\text{BaTiO}_3$   
H. Miyazawa, E. Natori, T. Shimoda, H. Kishimoto, F. Ishii and Tamio Oguchi  
(SEIKO EPSON Co., \*Hiroshima Univ.)
- (1-B-8) First Principle Studies on Elastic Properties and Spontaneous Polarizations of  $\text{PbTiO}_3$   
K. Nishida, S. Kasai, K. Tanaka, Y. Sakabe, F. Ishii\* and T. Oguchi\*  
(Murata Mfg. Co. and \*Hiroshima Univ.)
- (1-B-9) Visualization of the Ferroelectric Domain Orientation by Vertical and Lateral Piezoresponse Microscopy  
H. Niori(Okino), T. Ida, H. Ebihara and T. Yamamoto  
(National Defense Academy)
- (1-B-10) Higher Order Nonlinear Dielectric Imaging  
Y. Cho and K. Ohara  
(Tohoku Univ.)
- (1-B-11) Ferroelectric Properties and Structure Distortion in A-site-modified  $\text{SrBi}_2\text{Ta}_2\text{O}_9$   
Y. Noguchi, H. Shimizu\*, M. Miyayama, K. Oikawa\*\*, T. Kamiyama\*\*  
(Univ. of Tokyo, \*Sci Univ. of Tokyo, \*\*KEK)

Fundamentals and Liquid Crystals    Chairs: M. Takasige (Iwaki Meisei Univ.)                      13:15--14:45

- (1-E-1) Formation and Dynamic Behavior of Oxygen Vacancies in Barium-Strontium Titanate Ceramics  
T. Fukami, D. Agawa and N. Banba  
(Shinshu Univ.)
- (1-E-2) Syntheses of Potassium Niobate Crystal in Water Solution  
R. Komatsu, K. Adachi and K. Ikeda  
(Yamaguchi Univ.)
- (1-E-3) Domain Structures in  $\text{K}_3\text{Li}_{2-x}\text{Nb}_{5+x}\text{O}_{15+2x}$  Single-Crystal Fibers Produced by the Laser-Heated Pedestal Growth Technique  
M. Matsukura, T. Takeyama, T. Karaki and M. Adachi  
(Toyama Pref. Univ.)

- (1-E-4) Optical Anisotropy of the Alignment Films and Molecular Alignment of Liquid Crystals  
 S. Shimizu\*, S. Tatemori\*, H. Furue\*\*, M. Sakamoto\*, H. Uehara\* and J. Hatano\*,\*\*\*  
 (\*Sci. Univ. of Tokyo, \*\*Sci. and Tech. Co. and \*\*\*SUT in Yamaguchi)
- (1-E-5) Dielectric Behavior of Ferroelectric Phase in Antiferroelectric Liquid Crystals  
 M. Sakamoto\*, M. Ito\*, S. Tatemori\*, H. Uehara\*, J. Hatano\*,\*\*  
 (\*Sci. Univ. of Tokyo and \*\*Sci. Univ. of Tokyo in Yamaguchi)
- (1-E-6) Newly Developed Polymer-Stabilized Ferroelectric Liquid Crystals: Microsized Bistable Domains and Monostable V-shaped Switching  
 H. Furue\*, H. Yokoyama\*,\*\* and S. Kobayashi\*\*\*  
 (Jap. Sci. and Tech., Electrotechnical Lab. and Univ. of Tokyo in Yamaguchi)

Piezoelectric Materials (IV) Chairs: N. Ichinose (Waseda Univ.) 15:00--16:00

- (1-P-17) Influence of Liquid-Crystal Directors in Electric Field on Elastic Wave Propagation  
 M. Inoue, K. Yoshino, H. Moritake\* and K. Toda\*  
 (Osaka Univ. and \*National Defense Academy)
- (1-P-18) Transverse Sound Velocity of the Copolymer Film of Vinylidene Fluoride and Trifluoroethylene  
 Y. Tajitsu, S. Kanbara, T. Maeda, M. Date\* and E. Fukada\*  
 (Yamagata Univ. and \*Kobayashi Inst of Phys. Res.)
- (1-P-19) Mechanical Properties and Degradation in PZT Ceramics after Applying a Large Pulsed Input  
 K. Kitagawa, T. Toyoda, K. Yamana, K. Kitagawa\* and T. Yamamoto\*\*  
 (Industrial Res. Inst. of Tech., \*Kanazawa Univ. and \*\*National Defense Academy)
- (1-P-20) Waveforms of the Vibration Velocity and Current of a Piezoelectric Transducer at the Transient State  
 M. Umeda, K. Nakamura\*, S. Takahashi\*}\* and S. Ueha\*  
 (Nagaoka National College of Tech., Tokyo Inst. of Tech. and NEC)

Applications of Piezoelectrics (I) Chairs: Y. Yamashita (Toshiba Co.) 16:15--17:15

- (1-A-1)  $\text{PbNb}_2\text{O}_6$  Ceramics with Tungsten Bronze Structure for Low Qm Piezoelectric Material  
 J. Soejima and K. Nagata\*  
 (Kaijo Co. and \*Nat'l Defense Academy)
- (1-A-2) Development of Ultrasonic Transducer with  $\text{KNbO}_3$  Single Crystal for Detection of Harmonic Signals  
 H. Adachi, K. Wakabayashi, M. Nishio, H. Ogawa and Tomoo Kamakura\*  
 (Olympus Opt. Co. and \*Univ. of Electro-Communication)
- (1-A-3) Rotary Piezoelectric Actuator - A Novel Design for Dual Stage Actuation Systems in High Density Hard Disk Drives  
 Z. Wang, W. Zhu, O. K. Tan and X. Yao  
 (Nanyang Tech. Univ.)

(1-A-4) Single Crystal Growth and Characterizations of  $A_3BC_3D_2O_{14}$ -type Compounds for the Piezoelectric Applications

I. H. Jung, Y. H. Kang, K. B. Shim, A. Yoshikawa\*, T. Fukuda\* and K. H. Auh  
(Hanyang Univ and \*Tohoku Univ.)

Tutorial                                      Chairs: M. Okuyama (Osaka Univ.)                                      17:30--18:30

(1-TU-1) Piezoelectricity and its Device Application

Y. Cho  
(Tohoku Univ.)

June, 2 (Sat)

Applications of Piezoelectrics (II)      Chairs: T. Takenaka (Sci. Univ. of Tokyo)                                      9:00--10:15

(2-A-5) Measurement of Doppler Frequency Shift Using Leaky Lamb Wave Transducer

T. Fujita and K. Toda  
(National Defense Academy)

(2-A-6) Investigation on Mount Structure of Simple-Beam-Mount Piezoelectric Bimorph Actuator

C. Tanuma\*,\*\* and Y. Tomikawa\*\*  
(\*Toshiba TEC and \*\*Yamagata Univ.)

(2-A-7) FEM Analysis Gyro and Acceleration Sensor on One Chip Device using Quartz Crystal

T. Koitabashi\*\*, S. Kudo\*, S. Okada\*\* and Y. Tomikawa\*\*\*  
(\*Ind. Res. Inst. of Nagano Pref., \*\*MicroStone Co., \*\*\*Yamagata Univ.)

(2-A-8) Construction of a Low Frequency Flat-Type Piezoelectric Vibratory Gyroscope

H. Aisawa, S. Sugawara and J. Terada  
(Ishimaki Senshu Univ. and \*Matsusita Elec. Co.)

(2-A-9) Luminous Phenomenon of Silent Discharge by Using Piezoelectric Transformer

K. Teranishi, S. Suzuki and H. Itoh  
(Chiba Inst. of Tech.)

Thin Films (IX)                                      Chairs: H. Takasu (Rohm)                                      10:30--12:00

(2-T-39) Theory of Polarization and Electron Distribution at an Ideal Free Ferroelectric Surface and Ferroelectric/Insulator Interface

Y. Watanabe  
(Kyushu Univ.)

- (2-T-40) Fabrication and Electrical Characteristics of Trench Type MFMIS-FET  
 K. Sakamaki, S. Migita\*, S.B. Xiong\*, H.. Ota\*, S. Sakai\* and Y. Tarui\*  
 (Nippon Precision Circuits Inc. and \*Electrotechnical Lab.)
- (2-T-41) A New Stacked FeRAM Cell with High Immunity to Imprint Characteristics  
 Y. Nagano, T. Nasu, A. Noma, H. Yasuoka, T. Miki,  
 T. Nakamura, N. Moriwaki and E. Fujii  
 (Matsushita Electric Co.)
- (2-T-42) Deterioration of Device Characteristics of MESFET due to Fatigue  
 K. P. Lee, S. J. kang\*, D. H. Chang and Y. S. Yoon  
 (Inha Univ. and \*Yosu Nat'l Univ.)
- (2-T-43) Relationships among Coercive Voltage, Memory Window and Electric Distribution in Ferroelectric Gate Structure  
 S. K. Lee\*,\*\*, Y. T. Kim\*, S. I. Kim\* and C. E. Lee\*\*  
 (\*KIST and \*\*Korea Univ.)
- (2-T-44) Memory Window of Metal-Ferroelectric-Insulator-Silicon Structure Using Strained  $(\text{Ba}_{0.5}\text{Sr}_{0.5})\text{TiO}_3$  Films  
 S. Jun, Y. Roh and J. Lee  
 (Sung Kyun Kwan Univ)

Closing remarks

T. Shiosaki (Nara Inst. of Sci. and Tech.)

12:15