

**2011 International Symposium on
Applications of Ferroelectrics
(ISAF/PFM 2011) and 2011
International Symposium on
Piezoresponse Force Microscopy
and Nanoscale Phenomena
in Polar Materials**

**Vancouver, British Columbia, Canada
24 – 27 July 2011**



IEEE Catalog Number: CFP11ISA-PRT
ISBN: 978-1-4577-1162-6

TABLE OF CONTENTS

The Effect of A-Site and B-Site Ion Substitutions on The Temperatures of Ferroelectric and Magnetic Phase Transitions in Multiferroic $\text{PbFe}_{0.5}\text{Nb}_{0.5}\text{O}_3$	1
<i>I. Raevski, S. Kubrin, S. Raevskaya, S. Prosandeev, M. Malitskaya, Y. Zakharov, A. Lutokhin, V. Titov, D. Sarychev, E. Sitalo, A. Blazhevich, I. Zakharchenko</i>	
Evaluation of PMN-PT based Crystals for Various Applications	4
<i>S. Zhang, F. Li, J. Lee, D. Lin, T. Shrout, J. Luo</i>	
Piezoelectric Properties of Lead-Free Ferroelectric Ceramics under Some Specific Conditions	8
<i>H. Nagata, T. Takenaka</i>	
Application Of Single Crystalline PMN-PT And PIN-PMN-PT In High-performance Pyroelectric Detectors	12
<i>N. Neumann, P. Yu, Y. Ji, S. Lee, H. Luo</i>	
Effect of Manganese and Vanadium Valences for the Reliability of BaTiO_3-based MLCCs	16
<i>H. Natsui, T. Shibahara, O. Kido</i>	
Study of Nickel Inner Electrode Lead-Free Piezoelectric Ceramics	20
<i>S. Kawada, M. Kimura, H. Hayashi, K. Ogiso, T. Konoike, H. Takagi</i>	
Origin of Low-Frequency Dielectric Permittivity In BiFeO_3 Multiferroic Ceramics	24
<i>C. Tu, T. Wang, V. Schmidt, R. Chien</i>	
Applications Of Piezoelectric Materials In Oilfield Services	28
<i>N. Goujon, H. Hori, K. Liang, B. Sinha</i>	
Shaped Crystal Growth Of Languisite-Type Piezoelectric Single Crystals And Their Physical Properties	32
<i>Y. Yokota, A. Yoshikawa, Y. Futami, M. Sato, K. Tota, K. Onodera, T. Yanagida</i>	
Pressure-composition Phase Diagram of the $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$-$\text{PbTiO}_3$ Solid Solutions	36
<i>M. Ahari, R. Cohen, R. Hemley, Z. Ye, S. Sinogeikin, O. Shebanova, D. Ikuta</i>	
Temperature Stable High Energy Density Capacitors using Complex Perovskite Thin Films	40
<i>D. Kwon, M. Lee</i>	
Investigation of Domain Switching of PZT and KNN – based Ceramics	44
<i>A. Schonecker, M. Nicolai, F. Schlenkrich, T. Henschke, S. Uhlig</i>	
Impedance Spectroscopy Of PZT Ceramics - Measuring Diffusion Coefficients, Mixed Conduction And Pb Loss	48
<i>N. Donnelly, C. Randall</i>	
Advances in Relaxor Ferroelectric Terpolymer: New Applications	53
<i>F. Bauer, J. Capsal, Q. Larcher, F. Santos</i>	
Non-Planar Pad-Printed Thick-Film Focused High-Frequency Ultrasonic Transducers For Imaging And HIFU Applications	57
<i>M. Lethiecq, R. Lou-Moeller, J. Ketterling, F. Levassort, L. Huu-Hue, E. Filoux, R. Silverman, W. Wolny</i>	
Study on Domain Structure of NaNbO_3 Films by Laser Beam Scanning Microscope and Piezoresponse Force Microscope	61
<i>S. Yamazoe, A. Kohori, H. Sakurai, T. Wada, Y. Kitanaka, Y. Noguchi, M. Miyayama</i>	
Tunable RF Filters With Graded-Composition, MOCVD-Deposited BST Capacitors	65
<i>T. Kalkur, N. Sbrockey, M. Loung, M. Cole, G. Tompa</i>	
Lead-Zirconate Titanate (PZT) Nanoscale Patterning By Ultraviolet-Based Lithography Lift-Off Technique For Nano-Electromechanical Systems Applications	69
<i>S. Guillon, D. Saya, L. Mazenq, L. Nicu, C. Soyer, J. Costecalde, D. Remiens</i>	
Piezoelectric Transducer Based Devices for Development of a Sustainable Machining System – A Review	73
<i>R. Joshi, H. Singh</i>	
Ferro- and Piezoelectric Properties of $(\text{Bi}_{3.25}\text{Nd}_{0.75})\text{Ti}_3\text{O}_{12}$ Nanoplates Epitaxially Grown on $\text{Nb:TiO}_2(101)$ Substrates by Sputtering	77
<i>M. Kobune, A. Imagawa, R. Kishimoto, H. Nishioka, S. Nakashima, H. Fujisawa, M. Shimizu, H. Yamaguchi, K. Honda</i>	
Ferroelectric PLZT Films Grown on Metal Foils for Power Electronics Applications	80
<i>B. Ma, M. Narayanan, S. Liu, S. Chao, U. Balachandran</i>	
Vibration Energy Harvesting Using Piezoelectric Circular Diaphragm Array	84
<i>W. Wang, T. Yang, X. Chen, X. Yao, Q. Zhou</i>	
Ferroelectric Phase Transition In LiNbO_3: Insights From Molecular Dynamics	88
<i>S. Sanna, W. Schmidt</i>	

Lead-free BNT-BKT-BT Thin Films by Pulsed Laser Deposition Process	91
<i>M. Hejazi, A. Safari</i>	
Evaluation Of Polarization Of Embedded Piezoelectrics By The Thermal Wave Method	94
<i>G. Suchanek, W. Hu, G. Gerlach</i>	
Fabrication of (K,Na)NbO₃ Thin Films on Si substrate by Pulsed Laser Deposition	98
<i>M. Fukada, S. Yamazoe, T. Wada</i>	
Study Of Magnetism And Specific-Heat Properties For Multiferroic YCrO₃ Chromites	102
<i>Y. Su, L. Li, Z. Xing, Z. Feng, D. Deng, B. Kang, S. Cao, J. Zhang</i>	
First Principles Study Of Magnetic Properties Of EuTiO₃(001) Surfaces With Oxygen-Deficient	106
<i>T. Wu, H. Cao, L. Fang</i>	
Influence of Poling on RF and Pulsed DC Sputtered PZT Thin Films	109
<i>M. Jambunathan, K. Karakaya, R. Elfrink, R. Vullers, R. Schaijk</i>	
HF Dielectric Properties Of PZT Thin Films Processed By Sol-Gel Method On 3-Inches Si Wafers	113
<i>M. Thi, P. Martins, R. Bisaro, A. Ziaei</i>	
Analysis of the Admittance of Symmetrical Triple-layer Flexural Piezoelectric Vibrator	117
<i>L. Gong, J. Li, Y. Wang</i>	
A PZT Modeling for Energy Harvesting Circuits	121
<i>N. Hatti, K. Tungpimolrut, J. Phontip, K. Pechrach, P. Manoonpong, K. Komol</i>	
Interdiffusion At The Substrate-Film Interface Of BiFeO₃-PbTiO₃ Thin Films On Pt/Si Substrates	125
<i>F. Bygrave, T. Comyn, A. Bell</i>	
Influence of Mn+Y Co-doped on the Intrinsic Pyroelectricproperties of Ba_{0.67}Sr_{0.33}TiO₃ Ceramics	129
<i>Z. Xu, X. Chen, D. Yan, H. Liu, P. Yu, D. Xiao, J. Zhu</i>	
Orientational Dependence of Multiferroic Behaviors of La and Mn Modified BiFeO₃ Thin Films	132
<i>D. Wang, N. Chan, R. Zheng, C. Kong, S. Li, H. Chan</i>	
Study on Structures and Dielectric Properties of (Li_xNb_{1-x})_{0.25}Ti_{0.75}O₂ based on Molecular Simulation	136
<i>Y. Cheng, S. Yu, X. Xie, X. Sheng</i>	
A New SrBi₄Ti₄O₁₅/CaBi₄Ti₄O₁₅ Thin Film Capacitor for Excellent Electric Stability	139
<i>S. Nomura, K. Yamashita, M. Noda, H. Uchida, H. Funakubo</i>	
Influence Of Platinum Bottom Electrode On The Piezoelectric Performance Of Hot RF Sputtered PZT Films	142
<i>D. Kaden, H. Quenzer, B. Wagner, M. Kratzer, L. Castaldi, B. Heinz, R. Mamazza</i>	
Analysis and Modeling of a Bimorph AlN Piezoelectric Autonomous Microgenerator Stimulated by β-emitting Radioisotopes	146
<i>A. Dow, H. Al-Rubaye, N. Kherani, U. Schmid</i>	
Modeling of Hydrogen Diffusion in a Piezoceramic with Temperature Gradient	150
<i>Y. Sapsathiarn, R. Rajapakse, D. Mumford</i>	
Design of Energy Harvester Circuit for a MFC Piezoelectric based on Electrical Circuit Modeling	153
<i>K. Tungpimolrut, N. Hatti, J. Phontip, K. Komoljindakul, K. Pechrach, P. Manoonpong</i>	
Research on Dielectric Property of Polyethylene with Defects Based on Molecular Dynamics	157
<i>Y. Cheng, K. Zhang, X. Xie, S. Yu</i>	
Shear Piezoelectric Coefficient d₁₅ Of c-Axis Oriented Epitaxial Pb(Zr,Ti)O₃ Films	161
<i>I. Kanno, K. Akama, R. Yokokawa, H. Kotera</i>	
Stabilization and Thickness Dependence of Depletion Charge Induced Domains in Ferroelectric Nano Capacitors	164
<i>I. Misirlioglu, M. Yildiz</i>	
Growth of High Quality BiFeO₃ Thin Films by Dual Ion Beam Sputtering	168
<i>S. Nakashima, Y. Tsujita, S. Seto, H. Fujisawa, H. Nishioka, M. Kobune, M. Shimizu, J. Park, T. Kanashima, M. Okuyama</i>	
Prototype Capacitor Produced by Freeze Tape-Casting	172
<i>E. Gorzowski, M. Pan, B. Bender</i>	
The Effect Of Template Morphologies On Microstructure And Properties Of Textured K_{0.5}Na_{0.5}NbO₃ Ceramics By RTGG Method	175
<i>M. Cao, F. Li, M. Lv, H. Hao, Z. Yu, Z. Yao, H. Liu</i>	
Nanodomain Structures With Hierarchical Inhomogeneities In PMN-PT	179
<i>K. Kurushima, K. Kobayashi, S. Mori</i>	
Effects of (Gd,Mn)-Doping on Ferroelectric Properties of BiFeO₃ Thin Films Prepared Using Chemical Solution Deposition	182
<i>J. Kim, D. Do, S. Kim, M. Lee, Y. Sung, M. Kim, T. Song</i>	
EuMnO₃ Effects on Structure and Electrical Properties of Chemical Solution Deposited BiFeO₃ Thin Films	186
<i>D. Do, J. Kim, G. Kim, Y. Bae, E. Kim, S. Kim, M. Lee, H. Cho, J. Cho, J. Park, D. Kim, Y. Sung, M. Kim, T. Song</i>	

Variation Of Di-/Piezoelectric Properties Of PIN-PMN-PT Crystals Near Morphotropic Phase Boundary Along The Growth Direction	189
<i>L. Wang, Z. Xu, Z. Li, Y. Wan, J. Gao, F. Li</i>	
Microstructure and Dielectric Properties of (Sr_{0.88}Bi_{0.08})TiO₃-Bi(Mg_{1/2}Ti_{1/2})O₃ Ceramics.....	193
<i>H. Hao, B. Xiong, H. Liu, M. Cao, Z. Yu</i>	
Soft Mode Behavior In Strained SrTiO₃ Thin Film.....	196
<i>H. Wu, Y. Zhan, R. Zhang</i>	
Syntheses Of (Pb-Sn-Ti)O₃ Thin Films By PLD Method And Their Structural And Ferroelectric Properties	200
<i>J. Iwasaki, Y. Uesu, H. Yokota, P. Janolin, J. Kiat, R. Haumant</i>	
Shape-controlled Crystal Growth of Sr₃NbGa₃Si₂O₁₄ and Sr₃TaGa₃Si₂O₁₄ Piezoelectric Single Crystal by Micro-pulling-down Method.....	205
<i>Y. Yokota, A. Yoshikawa, Y. Futami, M. Sato, K. Tota, K. Onodera, T. Yanagida</i>	
Multiferroicity and Magnetoelectric Coupling in Ferrite–ferroelectric Particulate Ceramics	208
<i>Y. Zhou, D. Deng, Z. Feng, S. Yuan, S. Cao, J. Zhang</i>	
Storage of Information in Lithium Niobate Single Crystals	212
<i>A. Sternberg, K. Bormanis, N. Sidorov, P. Chufyrev, M. Palatnikov, V. Kalinnikov, E. Antonicheva, A. Syuy</i>	
Acoustic Biosensors For Medical And Environmental Purposes.....	214
<i>R. Ionescu, K. Jia, T. Houry, E. Eltzov, R. Marks</i>	
Effect of Different Annealing Methods on the Properties of PSTT Thin Films.....	218
<i>J. Zhu, D. Yan, X. Li, X. Chen, H. Liu, D. Xiao</i>	
Influence Of Interface Effect On The Ferroelectric And Ferromagnetic Properties Of CFO/PMNT Multilayered Thin Films	221
<i>J. Zhu, X. Chen, H. Guo, D. Yan, H. Liu, D. Xiao</i>	
LiNbO₃ Linear And Nonlinear Optical Response From First-Principles Calculations	224
<i>A. Riefer, S. Sanna, W. Schmidt, A. Gavrilenko</i>	
Piezoelectric Response of Novel Multiferroic Microcantilevers.....	228
<i>K. Prashanthi, T. Thundat, V. Palkar</i>	
Influence Of Ti On Multiferroic Properties Of Bi_{0.8}Ba_{0.2}Fe_{1-x}Ti_xO₃ Ceramics	231
<i>A. Gautam, V. Rangra, P. Uniyal, K. Yadav</i>	
Piezotransformer with Ring-dot-shape for Easy Heat Radiation and High Efficiency Power	235
<i>I. Kim, M. Kim, S. Jeong, J. Song, V. Thang</i>	
Acoustic Properties of Multiferroics PbFe_{1/2}Ta_{1/2}O₃ and BiFeO₃ at Néel Temperature	241
<i>M. Weihnacht, A. Sotnikov, H. Schmidt, E. Smirnova, S. Ktitorov</i>	
Dielectric Relaxation And Conductivity In Lead-Free Sodium Bismuth Titanate Ceramics.....	245
<i>D. Sharma, R. Kumar, S. Sharma, R. Rai, A. Kholkin</i>	
The Effect of Poling and Depoling on the Dielectric and Piezoelectric Properties of Relaxor Ferroelectric Solid Solution Single Crystal of 24Pb(In_{1/2}Nb_{1/2})O₃-46Pb(Mg_{1/3}Nb_{2/3})O₃-30PbTiO₃	249
<i>N. Yasuda, T. Fuwa, H. Ohwa, Y. Tachi, Y. Yamashita</i>	
In-Situ Large Scale Deposition Of PZT Films By RF Magnetron Sputtering	253
<i>M. Kratzer, L. Castaldi, B. Heinz, R. Mamazza, D. Kaden, H. Quenzer, B. Wagner</i>	
Low-frequency Reinforced Ferroelectric Acoustic Actuators.....	257
<i>H. Kim, W. Yang, K. No</i>	
Ferroelectricity in Bi₄Ti₃O₁₂ Nanorods	261
<i>M. Azodi, C. Harnagea, A. Pignolet, F. Rosei, V. Buscaglia, M. Buscaglia, P. Nanni</i>	
Acoustic Wave Filter Based on Periodically Poled Lithium Niobate.....	265
<i>E. Courjon, F. Bassignot, G. Ulliac, S. Ballandras</i>	
Microstructural Evolution And Electrical Properties Of Base-Metal Electroded BaTi₄O₉ Materials With B-Si-Ba-Zn-O Glass System	269
<i>C. Chou, Y. Su, Z. Liu, B. Utami, C. Chen, L. Chu</i>	
Dielectric Studies Of Ba₂Pr_xNd_{1-x}FeNb₄O₁₅ Ceramics	273
<i>J. Banys, S. Bagdzevicius, M. Kinka, V. Samulionis, R. Grigalaitis, E. Castel, M. Josse, M. Maglione</i>	
Structural Investigation Of LN/LT¹ Superlattice Thin Films By Field Effect Scanning Transmission Electron Microscopy Equipped With Electron Dispersive X-Ray Spectroscopy.....	276
<i>T. Kobata, G. Tsukahara, Y. Uesu, H. Yokota, A. Bartaszyte, S. Huband, S. Gorfman, D. Walker, P. Thomas, M. Glazer</i>	
Effect Of Divalent Ca Ions Substitution On Structure And Properties In Multiferroic YbCrO₃ Chromites	280
<i>Z. Xing, L. Li, Y. Su, D. Deng, Z. Feng, S. Cao, J. Zhang</i>	
Multilayer Thin-Film Capacitors Fabricated by Radio-Frequency Magnetron Sputtering	284
<i>Y. Imamiya, R. Yokokawa, I. Kanno, H. Kotera</i>	

Piezoelectric Active Mirror Suspension Embedded Into Low Temperature Co-Fired Ceramic	288
<i>M. Sobocinski, M. Leinonen, J. Juntti, H. Jantunen</i>	
New Acoustic Resonator Based On Periodically Poled Transducer In Lithium Niobate Or Tantalate	291
<i>F. Bassignot, G. Ulliac, E. Courjon, S. Ballandras, J. Lesage</i>	
A New Method of Ultrasonic Featured-Scan for Composite Materials	295
<i>K. Li, Y. Wu, D. Guo, K. Que, B. Chen</i>	
Synthesis Of Oriented BiFeO₃-PbTiO₃ By Molten Salt Method	298
<i>M. Palizdar, T. Comyn, S. Kulkarni, S. Roy, A. Bell</i>	
Transmission X-Ray Diffraction Studies On Bi₄Ti₃O₁₂ Single Crystals	302
<i>U. Salazar, M. Mendoza</i>	
Reactive Template Grain Growth Of BiFeO₃-PbTiO₃ By Using Bi₄Ti₃O₁₂, PbBi₄Ti₄O₁₅ And SrTiO₃ As Templates	305
<i>M. Palizdar, T. Comyn, A. Kleppe, A. Jephcoat, A. Bell</i>	
Crystallographic And Magnetic Identification Of Secondary Phase In Orientated Bi₅Fe_{0.5}Co_{0.5}Ti₃O₁₅ Ceramics	309
<i>M. Palizdar, T. Comyn, M. Ward, A. Brown, J. Harington, S. Kulkarni, L. Keeney, S. Roy, M. Pemble, R. Whatmore, C. Quinne, S. Kilcoyne, A. Bell</i>	
X-pod: A Novel Small Footprint Multi-legged Piezoelectric Single Crystal Actuator Concept	313
<i>R. Shukla, L. Lim, P. Gandhi</i>	
Application Of Piezoelectric Macro-Fiber-Composite Actuators For The Suppression Of Noise Transmission Through Curved Glass Plates	317
<i>K. Novakova, P. Mokry</i>	
A Digital Holographic Method for the Measurement of Piezoelectric Transformer Vibrations	321
<i>V. Ledl, P. Psota, R. Dolecek, J. Erhart, V. Kopecky</i>	
Unpowered Event Detection With An Autonomous Ferroelectric Capacitor Circuit	325
<i>J. Evans, B. Howard, S. Smith</i>	
An L-Section DC Electric Field Switchable Bulk Acoustic Wave Solidly Mounted Resonator Filter Based on Ba_{0.5}Sr_{0.5}TiO₃	329
<i>G. Saddik, R. York</i>	
Development Of CaMgSi₂O₆ Diopside Glass Ceramic As Microwave Dielectric Material	333
<i>C. Chou, K. Feng, C. Chen, L. Chu</i>	
Electrode Size Effect under PFM Characterization of PZT-film on Silicon Structures with Micro- and Nanometric Top Electrodes	337
<i>S. Bravina, N. Morozovsky, E. Eliseev, A. Morozovska, J. Costecalde, C. Soyer, D. Remiens, D. Deresmes</i>	
Structure and Electrical Properties of (La,Ta)-Doped (K_{0.5}Na_{0.5})_{0.94}Li_{0.06}Nb_{0.95}Ta_{0.05}O₃ Ceramic	340
<i>Y. Liu, R. Chu, Z. Xu, Q. Chen, G. Li</i>	
Structure and Electrical Properties of Ho-modified Sr₂Bi₄Ti₅O₁₈ Lead-free Piezoelectric Ceramics	343
<i>Q. Chen, Z. Xu, R. Chu, Y. Liu, M. Chen, L. Shao, G. Li</i>	
Author Index	