

**MATERIALS RESEARCH SOCIETY  
SYMPOSIUM PROCEEDINGS VOLUME 902**

**Ferroelectric Thin Films XIII**

November 28 – December 2, 2005  
Boston, Massachusetts, USA

Printed from e-media with permission by:

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)

ISBN: 1-55899-857-8

Some format issues inherent in the e-media version may also appear in the print version.

CAMBRIDGE UNIVERSITY PRESS  
Cambridge, New York, Melbourne, Madrid, Cape Town,  
Singapore, São Paulo, Delhi, Tokyo, Mexico City

Cambridge University Press  
32 Avenue of the Americas, New York, NY 10013-2473, USA

[www.cambridge.org](http://www.cambridge.org)

Materials Research Society  
506 Keystone Drive, Warrendale, PA 15086  
<http://www.mrs.org>

©Materials Research Society 2028

This publication is in copyright. Subject to statutory exception  
and to the provisions of relevant collective licensing agreements,  
no reproduction of any part may take place without the written  
permission of Cambridge University Press.

First published 2028

CODEN: MRSPDH

ISBN: 3/77: ; ; /: 79/:

Cambridge University Press has no responsibility for the persistence or  
accuracy of URLs for external or third-part Internet Web sites referred to  
in this publication and does not guarantee that any content on such Web sites  
is, or will remain, accurate or appropriate.

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

- 1 A Superlattice Approach to the Synthesis of Ferroelectric Strontium Bismuth Tantalate Thin Films Using Liquid-Injection-MOCVD**  
*Awad, Ahmed; Bailey, Paul; Chalker, Paul; Jones, Anthony; Noakes, Timothy; Potter, Richard; Wang, Peng*
- 7 Synthesis and Properties of Barium Titanate Thin Films Deposited on Copper Foil Substrates**  
*Borland, William; Ihlefeld, Jon; Maria, Jon-Paul*
- 15 PZT and PLZT Thin Films on Cu Substrates for Dielectric and Piezoelectric Applications: Effect of Processing Atmosphere and Film Strain**  
*Kim, Taeyun; Kingon, Angus; Srinivasan, Sudarsan*
- 21 Dielectric Property Controls Using Crystal Structure Anisotropy in Bismuth Layer-Structured Dielectrics**  
*Funakubo, Hiroshi; Suzuki, Muneyasu; Takahashi, Kenji; Takenaka, Tadashi; Watanabe, Takayuki*
- 27 Piezoelectric Properties of Lead Zirconate Titanate Films Prepared by Arc Discharged Reactive Ion-Plating Method**  
*Akamatsu, Masahiro; Iijima, Takashi; Tani, Masanao; Yasuda, Yoshiaki*
- 33 Electromechanical Fatigue for Ferroelectric Materials And**  
*Arias, Irene; Ortiz, Michael; Serebrinsky, Santiago*
- 39 Effect of Diameter on Longitudinal Displacement in Disk Shape 10-?m-Thick Lead Zirconate Titanate Films**  
*Iijima, Takashi; Okino, Hirotake; Osone, Satoko; Shimojo, Yoshiro; Yamamoto, Takashi*
- 45 Deposition of Highly (100) Oriented PZT Film Using Lanthanum Nitrate/Nickel Acetate Buffer Layer**  
*Choi, Jong-Jin; Hahn, Byung-Dong; Jang, Joo-Hee; Kim, Hyoun-Ee; Park, Dong-Soo; Yoon, Woon-Ha*
- 51 Characteristic Comparison of Epitaxial PZT and PMN-PT Films Grown on (100)<sub>c</sub>SrRuO<sub>3</sub>//(100)SrTiO<sub>3</sub> Substrates by Metalorganic Chemical Vapor Deposition**  
*Funakubo, Hiroshi; Iijima, Takashi; Katoda, Takashi; Nishida, Ken; Okamoto, Satoshi; Okino, Hirotake; Saito, Keisuke; Sakai, Joe; Yamamoto, Takashi; Yokoyama, Shintaro*
- 57 Microstructure and Ferroelectric Properties of Ultrathin PbTiO<sub>3</sub>Films by MOCVD**  
*Fujisawa, Hironori; Honda, Koichiro; Horii, Toru; Kotaka, Yasutoshi; Shimizu, Masaru; Takashima, Yoshiyuki*

- 63 Iridium Electrodes for Ferroelectric Capacitors Deposited by Liquid-Delivery MOCVD**  
*Burte, Edmund;Hur'yeva, Tetyana;Lisker, Marco;Ritterhaus, Yves*
- 69 Growth of Ferroelectric PbZrxTi1-XO3 (PZT) Thin Films by Liquid-Delivery Metalorganic Chemical Vapor Deposition**  
*Burte, Edmund;Lisker, Marco;Matichyn, Serhiy*
- 75 The Properties of Ferroelectric Domain of PLT Thin Films Prepared by RF Magnetron Sputtering**  
*Huang, Huidong;Li, Yanrong;Liu, Hong;Pu, Zhaozui;Wang, Zhihong;Xiao, Dingquan;Zhu, Jianguo*
- 81 Influence of the Lead-Compound on PZT 30/70 Thin Film Orientation**  
*Dražić, Goran;Kosec, Marija;Malić, Barbara;Mandeljc, Mira*
- 87 Initial Growth Behavior of Ultra-Thin *c*-Axis-Oriented Epitaxial SrBi<sub>2</sub>Ta<sub>2</sub>O<sub>9</sub> Films on SrTiO<sub>3</sub>**  
*Funakubo, Hiroshi;Suzuki, Muneyasu;Takahashi, Kenji;Yoshimoto, Mamoru*
- 93 Electrical Properties of Au/Bi<sub>4-x</sub>La<sub>x</sub>Ti<sub>3</sub>O<sub>12</sub> Thin Film/Si Structures and Reduction of Interface States**  
*Kohno, Atsushi;Tomari, Hiroyuki*
- 99 Epitaxial Growth of Strontium Bismuth Tantalate/Niobate on Buffered Magnesium Oxide Substrates**  
*Beach, David*
- 105 Electric-Field-Induced Displacements in Pt/PZT/Pt/SiO<sub>2</sub>/Si System Investigated by Finite Element Method: Material-Constant Dependences**  
*Funakubo, Hiroshi;Hayashi, Masahiro;Iijima, Takashi;Okino, Hirotake;Setter, Nava;Yamamoto, Takashi;Yokoyama, Shintaro*
- 111 Enhanced Electrical Properties in Mn-Doped Bi<sub>325</sub>La<sub>075</sub>Ti<sub>3</sub>O<sub>12</sub> Thin Films**  
*Ishiwara, Hiroshi;Singh, Sushil*
- 117 Effect of Composition on Ferroelectric Response of Bi<sub>4-X</sub>Sm<sub>X</sub>Ti<sub>3</sub>O<sub>12</sub> Thin Films**  
*Dussan, Sandra;Katiyar, Ram;Melgarejo, Ricardo;Tomar, Maharaj*
- 123 Dominant Factor of Squareness in *P-E* Hysterisis Loops of Mocvd-Pzt Films**  
*Funakubo, Hiroshi;Morioka, Hitoshi;Okamoto, Shoji;Sumi, Akihiro;Yokoyama, Shintaro*
- 129 Ba Substituted Pb(Zr<sub>x</sub>Ti<sub>1-x</sub>)O<sub>3</sub> Thin Films Grown by MOCVD**  
*Carella, Sergio;Cattaneo, Lorena;Hoffmann-Eifert, Susanne;Puchalla, Jochen;Waser, Rainer*

- 135 Evaluation of Pb Precursors for Liquid Injection Atomic Layer Deposition of Pb<sub>x</sub>Ti<sub>1-x</sub>O<sub>3</sub> Thin Films**  
*Hoffmann-Eifert, Susanne;Hwang, Cheol;Waser, Rainer;Watanabe, Takayuki*
- 141 Influence of Crystal Phase and Orientation on Electro-Optic Effect of PLZT Epitaxial Films**  
*Ishii, Masatoshi;Kondo, Masao;Kurihara, Kazuaki;Sato, Keisuke*
- 147 Ion Modification for Improvement of Electrical Properties of Perovskite-Based Ferroelectric Thin Films Fabricated by Chemical Solution Deposition Method**  
*Funakubo, Hiroshi;Katoda, Takashi;Koda, Seiichiro;Nakaki, Hiroshi;Nishida, Ken;Osada, Minoru;Uchida, Hiroshi;Ueno, Risako;Yasui, Shintaro*
- 153 Ferroelectric Gates for Modulation of 2D Electron Gas at GaN/AlGaN Interfaces**  
*Malin, Lisa;Muralt, Paul;Setter, Nava;Stolichnov, Igor*
- 159 Terahertz Radiation from Multiferroic BiFeO<sub>3</sub> Thin Films as a New Approach for Ferroelectric Memory Readout and Ferroelectric Domain Imaging Microscopy**  
*Kida, Noriaki;Takahashi, Kouhei;Tonouchi, Masayoshi*
- 165 Three-Dimensional Observation of Nano-Scale Ferroelectric Domain Using Scanning Nonlinear Dielectric Microscopy**  
*Cho, Yasuo;Sugihara, Tomoyuki*
- 171 New Method of Ferroelectric Thin Film Characterization Using a Polarization Instability Invoked by a Voltage Cycling**  
*Kunishima, Iwao;Shuto, Susumu;Yamada, Yuki*
- 177 Structural Dynamics of PZT Thin Films at the Nanoscale**  
*Adams, Bernhard;Do, Dal-Hyun;Dufresne, Eric;Eom, Chang-Beom;Evans, Paul;Grigoriev, Alexei;Kim, Dong Min*
- 183 Extrinsic Contributions to Piezoresponse Force Microscopy**  
*Peter, Frank;Reichenberg, Bernd;Rüdiger, Andreas;Szot, Krzysztof;Waser, Rainer*
- 189 Surface Photovoltage Spectroscopy for the Investigation of Perovskite Oxide Interfaces**  
*Beyreuther, Elke;Dorr, Kathrin;Eng, Lukas;Grafstrom, Stefan;Thiele, Christian*
- 200 Recent Developments in Thermodynamic Theory of Ferroelectric Thin Films**  
*Pertsev, Nikolay*

- 212 Strain Relaxation and Dislocation Confinement in Epitaxial SrTiO<sub>3</sub> by Two-Step Growth Technique and the Resulting Dielectric Response**  
*Muralt, Paul; Setter, Nava; Sherman, Vladimir; Su, Dong; Tagantsev, Alexander; Yamada, Tomoaki*
- 218 The Effects of PBB on the Dielectric Properties of BST Film**  
*Kim, Jin Cheol; Oh, Jun Rok*
- 227 Microwave Phase Shifters: Epitaxial Growth by Pulsed Laser Deposition of Dielectric Ba<sub>0.5</sub>Sr<sub>0.5</sub>TiO<sub>3</sub> Thin Films on MgO**  
*Jackson, T. J.; Jones, I. P.; Suherman, P. S.; Tse, Yau Yau*
- 233 Trap Charge Density at Interfaces of MOCVD Pt(Ir)/PZT/Ir(Ti/SiO<sub>2</sub>/Si) Structures**  
*Afanasjev, P.; Afanasjev, V.; Delimova, L.; Grekhov, I.; Kim, Suk-Pil; Koo, June-Mo; Mashovets, D.; Park, Youngsoo; Petrov, A.; Shin, Sangmin*
- 239 Real Information Recording in Ferroelectric Data Storage Medium with Memory Density of 1 Tbit/inch<sub>2</sub>**  
*Cho, Yasuo; Hiranaga, Yoshiomi; Tanaka, Kenkou*
- 245 10Tbit/inch<sub>2</sub> Ferroelectric Data Storage with Offset Voltage Application Method**  
*CHO, Yasuo; HASHIMOTO, Sunao*
- 251 A New Model of Imprint Mechanism in Ferroelectric Memory**  
*HAMADA, YASUAKI; HIGUCHI, TAKAMITSU; KIJIMA, TAKESHI; MIYAZAWA, HIROMU; NATORI, EIJI; OGUCHI, TAMIO; SHIMODA, TATSUYA; YOSHIYA, MASATO*
- 257 First-Principles Studies of Phase Stability and the Neutral Atomic Vacancies in LiNbO<sub>3</sub>, NaNbO<sub>3</sub> and KNbO<sub>3</sub>**  
*Shigemi, Akio; Wada, Takahiro*
- 263 Characterization of Lead Zirconate Titanate Powders Prepared by a Hydrothermal Method**  
*Che, Lingjuan; Chen, Chao; Cheng, Jinrong; Ding, Yongping; Meng, Zhongyan*
- 269 Surface Potential Investigation on Nano Domain Formation in Lithium Tantalate Single Crystal**  
*Cho, Yasuo; Katoh, Mirai*
- 275 Phase Transition Temperature of Ferroelectric Thin Film Evaluated by Four-State Potts Model**  
*Chung, Wing Yee Winnie; Lo, Veng Cheong*
- 281 Effect of PLT Buffer Layers on the PZT Thin Films for Scaling-Down Ferroelectric Materials**  
*Ahn, Byung Du; Chung, Hyun Woo; Lee, Eun Sun; Lee, Sang Yeol; Li, Dong Hua*

- 287 Fabrication of Transparent Ferroelectric-Gate Thin Film Transistors with Nonvolatile Memory Operation**  
*Tokumitsu, Etsuke*

- 293 Out-Of-Phase Boundary (OPB) Nucleation in Layered Oxides**  
*Carim, Altaf; Jia, Yunfa; Lettieri, James; Schlom, Darrell; Streiffer, Stephen; Zurbuchen, Mark*

- 299 Local Ferroelectric Switching Properties in BiFeO<sub>3</sub> Microstructures and Their Piezomagnetic Response**  
*Cojocaru, Cristian; Harnagea, Catalin; Pignolet, Alain*

- 305 Molecular Volume and Polarizability in the Amorphous Dielectric Zr<sub>0.2</sub>Sn<sub>0.2</sub>Ti<sub>0.6</sub>O<sub>2</sub>**  
*Barron, S.; van Dover, R.*

- 311 Observation of Domain Switching in Fatigued Epitaxial Pb(Zr,Ti)O<sub>3</sub> Thin Films**  
*Funakubo, Hiroshi; Kim, Yong Kwan; Kimura, Shigeru; Morioka, Hitoshi; Saito, Keisuke; Sakata, Osami; Ueno, Risako; Yokoyama, Shintaro*