SEUNGHYUN KIM

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a. Professional Preparation

- B.S., Yonsei University (Seoul, Korea), Ceramic Engineering, 1989
- M.S., Yonsei University (Seoul, Korea), Ceramic Engineering, 1991
- Ph.D., Yonsei University(Seoul, Korea), Ceramic Engineering, 1996
- Master of Arts (ad eundem), Brown University, 2013

b. Appointments

- 2011 to present: *Associate Professor,* School of Engineering, Brown University
- 2010 to 2011: *Executive Vice President,* MEMS Solution Inc.
- 2008 to 2009: *Invited Visiting Professor,* Dept. of Aeronautics and Astronautics, MIT
- 2004 to 2005: *Adjunct Professor,* Dept. of Physics, Kookmin University
- 2000 to 2010: *Executive Senior Vice President,* INOSTEK Inc.
- 1997 to 2000: *Post-Doc. and Research Scientist,* North Carolina state University (North Carolina)
- 1996 to 1997: *Senior Research Scientist,* Engineering Research Institute, Yonsei University (Korea)
- 1994 to 1996: *Research Scientist,* Division of Ceramics, Korea Institute of Science and Technology (Korea)
- 1993 to 1994: *Lecturer,* Ceramic Engineering, Yonsei University (Korea)
- 1991 to 1996: *Research Scientist,* Engineering Research Institute, Yonsei University (Korea)

c. Funded Research

1. Gift grant: Bio-compatible Flexible Electronic Systems ($700,000) Source of support: Company gift grant ($140,000/year for 5 years since 2015)
2. Brown- Xerox Collaboration on Innovative Lead-Free Piezoelectric Materials and Actuators ($110,000/year) (2014 - current)
3. A Xerox-Brown Collaborative Investigation of Environmentally Friendly Piezoelectric Materials for High-Strain Actuator Applications ($350,000) Source of support: NSF ECCS (GOALI) 3 years project (2014-2017)

d. Publications (130 peer-reviewed journal papers, 11 patents, and 177 presentations (including 35 invited presentations) in the international conferences)
- 10 selected journal papers

1. S. S. Won, J. Lee, V. Venugopal, D-J. Kim, J.K. Lee, I. W. Kim, A. I. Kingon, and **Seung-Hyun Kim**, "Lead-free Mn-doped ($K_{0.5}$, $Na_{0.5}$)NbO_3 piezoelectric thin films for MEMS-based vibrational energy harvester applications". Applied Physics Letters **108**, 232908 (2016)
2. S. S. Won, M. Sheldon, N. Mostovych, J. Kwak, B-S. Chang, C. W. Ahn, A. I. Kingon, I. W. Kim, and **Seung-Hyun Kim**, "Piezoelectric poly(vinylidene fluoride trifluoroethylene) thin film-based

power generators using paper substrates for wearable device applications", Applied Physics Letters **107**, 202901 (2015). One of the best featured articles in 2015 APL.

3. M. Kim, **Seung-Hyun Kim**, S. Hong, "Materials and devices for MEMS piezoelectric energy harvesting in Advances in Energy Harvesting Methods (Book), Ch. 17, 417-435, New York, Springer (2013).
4. J. Kwak, A.I. Kingon, and **Seung-Hyun Kim**,"Lead-free $(Na_{0.5},K_{0.5})NbO_3$ thin films for the implantable piezoelectric medical sensor applications", Materials Letters **82**, 130 (2012).
5. **Seung-Hyun Kim**, C. Y. Koo, J. Lee, W. Jiang, and A.I. Kingon, "Enhanced dielectric and piezoelectric properties of low-temperature processed PZT thick films prepared by hybrid deposition technique with chemical solution infiltration process", Materials Letters **65**, 3041 (2011).
6. J.S. Cross, **Seung-Hyun Kim**, S. Wada, and A. Chatterjee, "Characterization of Bi and Fe co-doped PZT capacitors for FeRAM", Sci. Technol. Adv. Mater. **11**, 044402 (2010).
7. D. Shen, J-H. Park, H. Noh, S-Y. Choe, **Seung-Hyun Kim**, H.C. Wikle, D-J. Kim, "Micromachined PZT cantilever based on SOI structure for low frequency vibration energy harvesting", Snsors and Actuators A: Physical, Vol. 154, Issue 1, 103 (2009).
8. Sergei V. Kalinin, Brian J. Rodriguez, **Seung-Hyun Kim**, Suk-Kyoung Hong, Alexei Gruverman, Eugene A. Eliseev, " Imaging mechanism of piezoresponse force microscopy in capacitor structures", Appl. Phys. Lett. **92**, 152906 (2008).
9. Brian J. Rodriguez, Stephen Jesse, and A. P. Baddorf, **Seung-Hyun Kim**, S. Kalinin, "Controlling polarization dynamics in a liquid environment : From localized to macroscopic switching in ferroelectrics", Physical Review Letters **98**, 247603 (2007)
10. J.Y.Jo, S.H. Han, J-G. Yoon, T.K. Song, **Seung-Hyun Kim**, T.W. Noh, "Domain switching kinetics in disordered ferroelectric thin films", Physical Review Letters **99**, 267602 (2007)

e. Synergistic Activities (selected)

- Program chair and committee of international conferences and symposia; Japan-Korea Ferroelectric Symposium (2004-Present), Ceramic Interconnect and Ceramic Microsystem Technology (2007-2011)
- Panel review member and project manager: Korea Evaluation Institute of Industrial Technology (2005 – present), Korea Institute of Energy Technology Evaluation and Planning (2005 – present)
- Manuscript reviewer for the following journals: J. of Applied Physics, Applied Physics Letters, J. of Smart Materials and Structures, Materials Letters, Thin Solid Films, Sensor and Actuators, J. of Electroceramic Society, Nano Technology, J. of Materials Science etc.
- Head of research center at industry; Transfer of science into industrial applications, managing and training of many scientist from R&D to QC level (2000-2011).
- Collaboration with industry: Motorola, LG Electronics, Inc., AVAGO Technologies, Kojundo Chemicals Laboratory, Samsung Electro-Mechanics, Samsung Advanced Institute of Technology, Texas Instrument, Philips, Oce Technology, Hynix, Fujitsu Laboratory, Panasonic, Xerox etc.
- Nomination of International Scientist of the Year for 2004 (by International Biographical Centre, Cambridge England).

f. Collaborators

Collaborators: M. Alexe (Max Planck Institute), A. Kholkin (Aveiro Univ.) O. Auciello (Argonne National Lab), J.S. Cross (Tokyo Institute of Technology), A. Gruvermann (University of Nebraska), S. Hong (Argonne National Lab), M. Kosec (Jozef Stefan Institute), T-W. Noh (Seoul National University), M. Okuyama (Osaka University), H. Park (IBM), S.K. Streiffer (Argonne National Lab), P. Vilarinho (Aveiro University, Portugal), B. L. Wardle (MIT) etc.

Thesis Advisor and Postgraduate-Scholar Sponsor

Graduate Students' Thesis Supervision (co-adviser): Miso Kim (MIT, 2011), C.Y. Koo (Yonsei University, Korea, 2012)

PUBLICATION LIST

Scientific Papers in Refereed Journals
(130 papers – scientific citation: >1200 times - based on Web of Science- ISI)
95 Peer-refereed Journal Papers and 22 Refereed Proceedings and 11 Patents (5 US Patents)

1. S. C. Park, R. Song, S. Kim, H. K. Kim, **Seung-Hyun Kim** and J. Lee, "Fabrication of Artificial Arteriovenous Fistula and its Flow Field and Shear Stress Analysis using μ-PIV Technology", J. of Mechanical Science and Technology, **30**(12), 5503 (2016).
2. S. S. Won, J. Lee, V. Venugopal, D-J. Kim, J.K. Lee, I. W. Kim, A. I. Kingon, and **Seung-Hyun Kim**, "Lead-free Mn-doped ($K_{0.5}$, $Na_{0.5}$)NbO_3 piezoelectric thin films for MEMS-based vibrational energy harvester applications". Applied Physics Letters **108**, 232908 (2016).
3. S. S. Won, J. Lee, V. Venugopal, D-J. Kim, J.K. Lee, I. W. Kim, A. I. Kingon, and **Seung-Hyun Kim**, "Lead-free Mn-doped ($K_{0.5}$, $Na_{0.5}$)NbO_3 piezoelectric thin films for MEMS-based vibrational energy harvester applications". Applied Physics Letters **108**, 232908 (2016).
4. Y. J. Ko, D. Y. Kim, S. S. Won, C. W. Ahn, I. W. Kim, **Seung-Hyun Kim**, A. I. Kingon, J-H. Ko, and J. H. Jung, "Flexible PZT films for a hybrid piezoelectric-pyroelectric nanogenerator under harsh environments". ACS Applied Materials and Interfaces **8**, 6504 (2016).
5. S. S. Won, M. Sheldon, N. Mostovych, J. Kwak, B-S. Chang, C. W. Ahn, A. I. Kingon, I. W. Kim, and **Seung-Hyun Kim**, "Piezoelectric poly(vinylidene fluoride trifluoroethylene) thin film-based power generators using paper substrates for wearable device applications", Applied Physics Letters **107**, 202901 (2015). One of the best featured articles in 2015 APL.
6. C. Shin, G-G. Lee, D-H. Han, S-P. Han, E. Tokumitsu, S-I. Ohmi, D-J. Kim, H. Ishiwara, M. Park, **Seung-Hyun Kim**, W-G. Lee, Y-J. Hwang, B-E. Park, "Experimental demonstration of a ferroelectric FET using paper substrate", IEICE Electron Express, **11**(14) 1 (2014).
7. H. Maiwa and **Seung-Hyun Kim**, "Electrocaloric and pyroelectric properties of PZT and PMN–PNN–PZT thin films", Ceramics International, **39**, 497 (2013)
8. M. Kim, **Seung-Hyun Kim**, S. Hong, "Materials and devices for MEMS piezoelectric energy harvesting in Advances in Energy Harvesting Methods (Book), Ch. 17, 417-435, New York, Springer (2013).
9. S-B. Kim, H. Park, **Seung-Hyun Kim**, H.C. Wikle, J-H. Park, D-J. Kim, "Comparison of MEMS PZT cantilevers based on d31 ad d33 modes for vibration energy harvesting", J. MEMS, **22**, 26 (2012).
10. S-B. Kim, J-H. Park, **Seung-Hyun Kim**, H. Ahn, H.C. Wikle, and D-J. Kim, "Modeling and evaluation of d_{33} mode piezoelectric energy harvesters", J. Micromech. Microeng.**22**, 105013 (2012).
11. S. Lee, **Seung-Hyun Kim**, Y. Kim, A.I. Kingon, D.C. Paine, and K. No, "Structural and electrical properties of transparent conducting Al_2O_3-doped ZnO thin films using off-axis DC magnetron sputtering", Materials Letters **85**, 88 (2012).
12. J. Kwak, A.I. Kingon, and **Seung-Hyun Kim**,"Lead-free ($Na_{0.5}$,$K_{0.5}$)NbO_3 thin films for the implantable piezoelectric medical sensor applications", Materials Letters **82**, 130 (2012).
13. C.Y. Koo, K. Song, Y. Jung, W. Yang, **Seung-Hyun Kim**, S. Jeong, and J. Moon, "Enhanced performance of solution-processed amorphous LiYInZnO thin-film transistors", ACS Appl. Mater. Interfaces **4**, 1456 (2012).
14. **Seung-Hyun Kim**, A. Leung, L. Kuhn, W. Jiang, C. Y. Koo, D-J. Kim, and A.I. Kingon, "Lead-free ($Na_{0.5}$,$K_{0.5}$)($Nb_{0.95}$,$Ta_{0.05}$)O_3-$BiFeO_3$ thin films for MEMS piezoelectric vibration energy harvesting devices", Materials Letters **69**, 24 (2011).
15. D. Liu, B. Zhou, S. H. Yoon, S-B. Kim, H. Ahn, B. C. Prorok, **Seung-Hyun Kim**, and D-J. Kim, "Determination of the true Young's modulus of PZT films by nanoindentation : effects of film orientation and substrate," J. Am. Ceram. Soc. **94** [11] 3698 (2011).
16. **Seung-Hyun Kim**, W. Jiang, B. Turan, I-B. Shim, and A.I. Kingon, "Low electrical resistivity of Ni-doped La-cobaltite thin films using a novel chemical solution route for thermoelectric applications", Jpn. J. Appl. Phys. **50**, 115801 (2011).
17. **Seung-Hyun Kim**, C. Y. Koo, J. Lee, W. Jiang, and A.I. Kingon, "Enhanced dielectric and piezoelectric properties of low-temperature processed PZT thick films prepared by hybrid deposition technique with chemical solution infiltration process", Materials Letters **65**, 3041 (2011).

18. J.S. Cross, **Seung-Hyun Kim**, S. Wada, and A. Chatterjee, "Characterization of Bi and Fe co-doped PZT capacitors for FeRAM", Sci. Technol. Adv. Mater. **11**, 044402 (2010).
19. J.S. Cross, K. Shinozaki, T. Yoshioka, J. Tanaka, **Seung-Hyun Kim**, H. Morioka, and K. Saito, "Characterization and ferroelectricity of Bi and Fe co-doped PZT films", Materials Science and Engineering B **173**, 18-20 (2010).
20. Y.H. Jang, Q. Zhang, C.H. Kim, H.J. Hwang, J.H. Cho, and **Seung-Hyun Kim**, "Domain switching behaviors of PZT thin films obtained by using piezoresponse force microscopy", J. Kor. Phys. Soc. Vol.56, No 1, 443-447 (2010).
21. C.Y. Koo, K. Song, T. Jun, D. Kim, Y. Jung, **Seung-Hyun Kim**, J. Ha, J. Moon, "Low temperature solution-processed In-ZnO thin film transistors", J. of Electrochemical Soc. **157** (4) J111-J115 (2010).
22. D. Shen, J-H. Park, H. Noh, S-Y. Choe, **Seung-Hyun Kim**, H.C. Wikle, D-J. Kim, "Micromachined PZT cantilever based on SOI structure for low frequency vibration energy harvesting", Snsors and Actuators A: Physical, Vol. 154, Issue 1, 103 (2009).
23. **Seung-Hyun Kim**, C.Y. Koo, J-H. Cheon, J. Ha, J-W. Lee, I-H. Lee, W.S. Kim, Brian L. Wardle, "High dielectric PLZT thin films for embedded capacitors", J. Kor. Phys. Soc. Vol.54, No 2, 840 (2009).
24. I.K. Bdkin, A.L. Kholkin, A.N. Morozovska, Sergei V. Svechnikov, **Seung-Hyun Kim**, Sergei V. Kalinin, "Domain dynamics in piezoresponse force spectroscopy : Quantitative de convolution and hysteresis loop fine structure", Appl. Phys. Lett. **92**, 182909 (2008).
25. H. Maiwa and **Seung-Hyun Kim**, "Temperature dependence of electrical and electromechanical properties of PMN-PNN-PZT thin films", Ceramics International **34**(4) 961-965 (2008).
26. J.Y.Jo, S.M. Yang, H.S. Han, D.J. Kim, W.S. Choi, T.W. Noh, T.K. Song, J-G. Yoon, C.Y. Koo, J-H. Cheon, and **Seung-Hyun Kim**, "Composition-dependent polarization switching behaviors of (111)-preferred polycrystalline Pb(ZrxTi1-x)O3 thin films ", Appl. Phys. Lett. **92**, 021917 (2008).
27. C.Y. Koo, D. Kim, S. Jeong, J. Moon, C. Park, M. Jeon, W-C. Sin, J. Jung, H.J. Woo, **Seung-Hyun Kim**, J. Ha, "Sol-gel derived Ga-In-Zn-O semiconductor layers for solution-processed thin film transistors," J. Kor. Phys. Soc. Vol.53, No 1, 218 (2008).
28. Sergei V. Kalinin, Brian J. Rodriguez, **Seung-Hyun Kim**, Suk-Kyoung Hong, Alexei Gruverman, Eugene A. Eliseev, " Imaging mechanism of piezoresponse force microscopy in capacitor structures", Appl. Phys. Lett. **92**, 152906 (2008).
29. Y. Kim, Simon, Buhlmann, S. Hong, Y.W. Kim, **Seung-Hyun Kim**, K. No, "Screen charge transfer by ground tip on ferroelectric surfaces", Phys. Stat. Sol. (RRL) **2**, No. 2, 74 (2008).
30. D-J. Kim, J-H. Park, D. Shen, J.W. Lee, A.I. Kingon, Y.S. Yoon, and **Seung-Hyun Kim**, "Thickness dependence of submicron thick $Pb(Zr_{0.3}Ti_{0.7})O_3$ films on piezoelectric properties", Ceramics International, Vol.34, Issue 8, 1909 (2008).
31. J.Y.Jo, S.H. Han, J-G. Yoon, T.K. Song, **Seung-Hyun Kim**, T.W. Noh, "Domain switching kinetics in disordered ferroelectric thin films", Physical Review Letters **99**, 267602 (2007)
32. Brian J. Rodriguez, Stephen Jesse, and A. P. Baddorf, **Seung-Hyun Kim**, S. Kalinin, "Controlling polarization dynamics in a liquid environment : From localized to macroscopic switching in ferroelectrics", Physical Review Letters **98**, 247603 (2007)
33. Y. Kim, Simon, Buhlmann, S. Hong, **Seung-Hyun Kim**, K. No, "Injection charge assisted polarization reversal in ferroelectric thin films", Appl. Phys. Lett. **90**, 072910 (2007).
34. A.L. Kholkin, I.K. Bdkin, D.A. Kiselev, V.V. Shvartsman, and **Seung-Hyun Kim**, "Nanoscale characterization of polycrystalline ferroelectric materials for piezoelectric applications", J. Electroceram. **19**, 81 (2007)
35. Y. Kim, S. Hong, H. Park, **Seung-Hyun Kim**, D-K. Min, K. No, "Grain/domain interaction and its effect on bit formation in ferroelectric films" Integrated Ferroelectrics **78**, 255 (2006).
36. Y. Kim, Y. Cho, S. Hong, Simon, Buhlmann, H. Park, D-K. Min, **Seung-Hyun Kim**, K. No, "Correlation between grain size and domain size distribution in ferroelectric media for probe storage application" Appl. Phys. Lett. **89**, 162907 (2006).
37. Y. Kim, Y. Cho, S. Hong, Simon, Buhlmann, H. Park, D-K. Min, **Seung-Hyun Kim**, K. No, "Tip traveling and grain boundary effects in domain formation using piezoelectric force microscopy for probe storage applications" Appl. Phys. Lett. **89**, 172909 (2006).
38. Y. Kim, S. Hong, **Seung-Hyun Kim**, K. No, "Surface potential of ferroelectric domains investigated by Kelvin force microscopy" J. Electroceram , 17, 185 (2006).

39. J. Kim, Y. Kim, K. No, S. Buhlmann, Y-W. Nam, S. Hong, **Seung-Hyun Kim**, "Surface potential relaxation of ferroelectric domain investigated by Kelvin force microscopy" Integrated Ferroelectrics **85**, 25 (2006).
40. C.Y. Koo, J-H. Cheon, Y-H. Yeom, J. Ha, and **Seung-Hyun Kim**, "Electrical Properties of BiFeO3 doped PZT thin films for embedded FeRAM devices", J. Kor. Phys. Soc. Vol.49, S514 (2006).
41. Hyunjung Shin, Bongki Lee, changhyun Kim and, **Seung-Hyun Kim**, "Ultra thin and isolated dots in polycrystalline lead zirconate titanate thin films", IEEE Transaction on Ultrasonics, Ferroelctrics and Frequency Control, Vol. 53, No. 12, 2333 (2006).
42. B. Lee, C. Kim, **Seung-Hyun Kim**, C. Bae, H. Shin, "Revisit of phase transformation kinetics in PZT thin films by sol-gel method", Integrated Ferroelectrics **78**, 247 (2005)
43. **Seung-Hyun Kim**, Y.S. Yoon, H. Shin, "Piezoelectric PZT thin films for MEMS applications" Ceramist **7**, 339 (2004).
44. B. Lee, C. Kim, **Seung-Hyun Kim**, C. Bae, H. Shin, "Revisit of phase transformation kinetics in PZT thin films by sol-gel method using scanning force microscopy" Ultramicroscopy **68**, 247 (2004).
45. B. Lee, C. Bae, **Seung-Hyun Kim**, H. Shin, "Characterization of self-assembling isolated ferroelectric domains by scanning force microscopy" Ultramicroscopy **100**, 339 (2004).
46. **Seung-Hyun Kim**, Chang Young Koo, Su-Min Ha, Hyun-Jung Woo, Dong-Yeon Park, Jieun Lim, Cheol Seong Hwang, and Jowoong Ha, "Thickness scaling of $Pb(Zr,Ti)O_3$ thin films and Pt electrodes for high density FeRAM devices" Integrated Ferroelectrics **48**, 139 (2003).
47. Seehwa Jeong , Jin Shi-Zhao, Hye Ryoung Kim, Dong-Yeon Park, Cheol Seong Hwang, Young Ki Han, Cheol Hoon Yang, Ki Young Oh, **Seung-Hyun Kim**, Dong-Soo Lee, and Jowoong Ha, "Metal-organic chemical vapor deposition of $Pb(Zr,Ti)O_3$ thin films with different precursor solutions for testing mass-production compatibility" J. Electrochem. Soc. **150**, No. 10, C678 (2003).
48. **Seung-Hyun Kim**, Jeong-Suong Yang, Chang Young Koo, Jung-Hoon Yeom, Dong-Su Lee, Cheol Seong Hwang, Kyu-Ho Hwang, and Jowoong Ha, "Electromechanical Properties of $Pb(Zr,Ti)O_3$ Films for MEMS Applications" J. Kor. Phys. Soc. **42**, S1101 (2003).
49. **Seung-Hyun Kim**, Chang Young Koo, Dong-Yeon Park, Dong-Su Lee, Jung-Hoon Yeom, Jieun Lim Cheol Seong Hwang, and Jowoong Ha, "Scaling issues of $Pb(Zr,Ti)O_3$ capacitor stack for high density FeRAM devices" J. Kor. Phys. Soc. **42**, S1417 (2003).
50. Jeong-Suong Yang, **Seung-Hyun Kim**, Dong-Yeon Park, Euijoon Yoon, Joon-Shik Park, Tae-Song Kim, Sung-Goon Kang, and Jowoong Ha, "Thickness effects on the pyroelectic properties of chemical solution-derived $Pb(Zr_{0.3},Ti_{0.7})O_3$ thin films for the infra-red sensor devices" Jpn. J. Appl. Phys. **42** (Part 1, No. 9B), 5956 (2003).
51. **Seung-Hyun Kim**, Jeong-Suong Yang, Chang Young Koo, Jung-Hoon Yeom, Euijoon Yoon, Cheol Seong Hwang, Joon-Shik Park, Sung-Goon Kang, Dong-Joo Kim, and Jowoong Ha, "Dielectric and electromechanical properties of $Pb(Zr,Ti)O_3$ thin films for piezo-microelectromechanical system devices" Jpn. J. Appl. Phys. **42** (Part 1, No. 9B), 5952 (2003).
52. S-N. Ryoo, S-G. Yoon, and **Seung-Hyun Kim**, "Improvement in ferroelectric properties of $Pb(Zr_{0.35},Ti_{0.65})O_3$ thin films using a $Pb_2Ru_2O_{7-X}$ conductive interfacial layer for ferroelectric random access memory application" Appl. Phys. Lett. **83**(14), 2880 (2003).
53. Joon-Shik Park, **Seung-Hyun Kim**, Hyo-Duk Park, Jowoong Ha, and Sung-Goon Kang, "Characterization of sol-gel multi-coated thick PZT films on platinized silicon substrates for micro devices applications" Jpn. J. Appl. Phys. **42** (Part 1, No. 12), 7497 (2003).
54. H. Maiwa, **Seung-Hyun Kim**, and N. Ichinose, "Temperature dependence of electrical and electromechanical properties of PZT thin films" Appl. Phys. Lett. **83**, 4396 (2003).
55. W-K. Jung, Y-S. Choi, C. Bae, B-K. Lee, **Seung-Hyun Kim**, H. Shin, "Fabrication of isolated ferroelectric domains in nano-scale" Integrated Ferroelectrics **59**, 1521 (2003).
56. Jeong-Suong Yang, **Seung-Hyun Kim**, Chang Young Koo, Jung-Hoon Yeom, Cheol Seong Hwang, Euijoon Yoon, Dong-Joo Kim, and Jowoong Ha, "Piezoelectric and pyroelectric properties of PZT films for micro-sensors and actuators" Integrated Ferroelectrics **54**, 515 (2003).
57. **Seung-Hyun Kim**, Dong-Yeon Park, Hyun-Jung Woo, Dong-Su Lee, Jowoong Ha, and Cheol Seong Hwang, "Effects of IrO_2/Pt hybrid electrodes on the crystallization and ferroelectric performances of sol-gel-derived $Pb(Zr,Ti)O_3$ thin film capacitors", J. Mater. Res. **17**(7), 1735 (2002).
58. Jin Shi-Zhao, Ji Eun Lim, Seehwa Chung, Moon Joo Cho, Cheol Seong Hwang, **Seung-Hyun Kim**, "Heat-treatment induced ferroelectric fatigue of $Pt/Sr_{1-x}Bi_{2+y}Ta_2O_9$/Pt thin-film capacitors", Appl. Phys. Lett. **81**(8), 1477 (2002).

59. **Seung-Hyun Kim**, Dong-Yeon Park, Hyun-Jung Woo, Dong-Su Lee, Jowoong Ha, Cheol Seong Hwang, In-Bo Shim, and A.I. Kingon, "Orientation effects in chemical solution derived $Pb(Zr_{0.3},Ti_{0.7})O_3$ thin films on ferroelectric properties", Thin Solid Films **416**, 264 (2002).
60. Jieun Lim, Dong-Yeon Park, Jae Kyoung Jung, Gregor Darlinski, Hyeong Joon Kim, Cheol Seong Hwang, **Seung-Hyun Kim**, Chang Young Koo, Hyun-Jung Woo, Dong-Su Lee and Jowoong Ha, "Dependence of ferroelectric performance of sol-gel derived $Pb(Zr,Ti)O_3$ thin films on bottom-Pt-electrode thickness", Appl. Phys. Lett. **81**(17), 3224 (2002).
61. **Seung-Hyun Kim**, Chang Young Koo, Su-Min Ha, Hyun-Jung Woo, Dong-Yeon Park, Jieun Lim, Cheol Seong Hwang, and Jowoong Ha, "Thickness scaling of $Pb(Zr,Ti)O_3$ thin films and Pt electrodes for high density FeRAM devices", Integrated Ferroelectrics **48**, 139 (2002).
62. Dong-Su Lee, Dong-Yeon Park, Hyun-Jung Woo, **Seung-Hyun Kim**, Jowoong Ha, and Euijoon Yoon, "Preferred orientation controlled giant grain growth of platinum thin films on amorphous substrates", Jpn. J. Appl. Phys. **40** (Part 2, No. 1A/B), L1 (2001).
63. **Seung-Hyun Kim**, Hyun-Jung Woo, Jowoong Ha, Cheol Seong Hwang, Hae Ryoung Kim, and Angus I. Kingon, "Thickness effects on imprint in chemical-solution-derived $(Pb,La)(Zr,Ti)O_3$ thin films", Appl. Phys. Lett. **78**(19), 1 (2001).
64. S-G. Yoon, S.G. Wicaksana, D. Kim, D-J. Kim, **Seung-Hyun Kim**, and A.I. Kingon, "Effect of hydrogen on true leakage current characteristics of $(Pb,La)(Zr,Ti)O_3$ thin- film capacitors with Pt- or Ir-based top electrodes", J. Mater. Res. **16**(4), 1185-1189 (2001).
65. Jowoong Ha, Dong-Yeon Park, Hyun-Jung Woo, **Seung-Hyun Kim**, and Dong-Su Lee, "Effects of electrodes on the electrical properties of ferroelectric devices", Ceram. Soc. Japan (Asian Ceramics Science for Electronics I) **7**, 55 (2001).
66. **Seung-Hyun Kim**, Jowoong Ha, Cheol Seong Hwang, and Angus I. Kingon, "Ca- and Sr-doped $(Pb_{1-x}La_x)(Zr_yTi_{1-y})_{1-x/4}O_3$ thin films for low-voltage operation", Thin Solid Films **394**, 131 (2001).
67. **Seung-Hyun Kim**, Dong-Yeon Park, Hyun-Jung Woo, Dong-Su Lee, Jowoong Ha, Cheol Seong Hwang, Seehwa Jeong and Angus I. Kingon, "The low-voltage-switching behavior of sol-gel-derived $Pb(Zr,Ti)O_3$ thin film capacitors", Integrated Ferroelectrics **39**, 13 (2001).
68. J-P. Maria, K. Cheek, S.K. Streiffer, **Seung-Hyun Kim**, G. Dunn and A.I. Kingon, "Lead zirconate titanate thin films on base-metal foils; An approach for embedded high K passive components", J. Am. Ceram. Soc. **84**, 2436 (2001).
69. J.A. Christman, **Seung-Hyun Kim**, H. Maiwa, J-P. Maria, B.J. Rodriguez, A.I. Kingon, and R.J. Nemanich, "Spartial variation of ferroelectric properties in PZT thin films studied by atomic force microscopy " J. Appl. Phys. **87**, 8031 (2000).
70. **Seung-Hyun Kim**, D-J. Kim, J-P. Maria, S. K. Streiffer, J. Im, O. Auciello, A. R. Krauss, and A.I. Kingon, "Influence of Pt heterostructure bottom electrodes on $SrBi_2Ta_2O_9$ thin film properties", Appl. Phys. Lett. **76**(4), 496 (2000).
71. **Seung-Hyun Kim**, Dong-Su Lee, Cheol Seong Hwang, Dong-Joo Kim, and A.I. Kingon, "Thermally induced voltage offsets in $Pb(Zr,Ti)O_3$ thin films", Appl. Phys. Lett. **77**(19), 3036 (2000).
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78. "Evolution of Isolated Ferroelectric Domains in Nanometer Scale," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, November (2004).
79. "Piezoelectric characteristic map of PZT films for microelectromechanical system," *5th Korea-Japan Conference on Ferroelectricity*, Seoul, Korea, August (2004) **(Invited presentation).**

80. "Domain growth scenario and its implication to high density storage device," *5th Korea-Japan Conference on Ferroelectricity*, Seoul, Korea, August (2004) **(Invited presentation).**
81. "Dielectric characteristics of La-doped PZT films on base-metal foils for high-k embedded capacitors," *5th Korea-Japan Conference on Ferroelectricity*, Seoul, Korea, August (2004).
82. "Dielectric characteristics of PLZT films on base-metal foils for embedded power electronic systems," *21st Meeting on Ferroelectric Materials and Their Applications (FMA21)*, Kyoto, Japan, May (2004).
83. "Electromechanical property map of Pb-based films for Microsystems," *21st Meeting on Ferroelectric Materials and Their Applications (FMA21)*, Kyoto, Japan, May (2004).
84. "Fatigue, imprint and charge retention characteristics of PZT thin films for high density FRAM devices," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004) **(Invited Presentation)**.
85. "Fabrication and characterization of $Pb(Zr,Ti)O_3$ thick films for MEMs applications," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
86. "Dielectric properties of PZT and PLZT films on base-metal foils for advanced power electronic systems," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
87. "Nanoscale properties of sol-gel derived PZT films as a function of the concentration," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
88. "The study of La-doped PZT films using $LaNiO_3$ electrode deposited on base-metal foils," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
89. "Piezoelectric property map of $Pb(Zr,Ti)O_3$ thin films for MEMS applications," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
90. "Temperature dependence of electrical properties and piezoelectric response of PZT thin films," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
91. "Fabrication of resistance temperature detection wafer using giant-grained platinum thin Films deposited on Si wafer," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
92. "Orientation control and characterization of giant grains of reactively sputtered platinum films on silicon and sapphire substrates," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
93. "Charge retention characteristics of PZT thin films for high density FeRAM devices," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
94. "Nanoscale domains and local electromechanical hysteresis in ferroelectric films studied via scanning force microscopy," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
95. "Revisit of phase transformation kinetics in PZT thin films by sol-gel method using scanning force microscopy," *16h International Symposium on Integrated Ferroelectrics*, Gyeongju, Korea, April (2004).
96. "Thickness and composition dependence of piezoelectric properties of PZT thin films for MEMS devices," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (2003).
97. "The dielectric characteristics of PZT/LNO films deposited on base-metal sheets for power electronic systems," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (2003).
98. "Charge retention characteristics of PZT thin films for high density FeRAM devices," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (2003).
99. "Kinetics of phase transformation of PZT thin films by sol-gel method using scanning force microscopy," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (2003).
100. "Ferroelectric domain structure and local piezoelectric properties of sol-gel derived PZT films," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (2003).
101. "Frequency-dependent electromechanical response in ferroelectric materials measured via piezoresponse force microscopy," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (2003).
102. "Enhanced figure of merit characteristics of PZT thin films for uncooled pyroeletric IR sensors," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (2003).
103. "Ultra thin PZT films and Pt electrode for high density FeRAM devices," *10th European Meeting on Ferroelectrcity (EMF 10)*, Cambridge, UK, August (2003).
104. "High performance PZT thin films for piezo-sensor and uncooled IR detectors," *10th European Meeting on Ferroelectrcity (EMF 10)*, Cambridge, UK, August (2003).

105. "Dielectric and electromechanical properties of highly textured PZT thin films for piezo-MEMS devices," *20th Meeting on Ferroelectric Materials and Their Applications (FMA20)*, Kyoto, Japan, May (2003).
106. "Characterization of sol-gel multi-coated thick PZT films on platinized silicon substrates for micro device applications," *20th Meeting on Ferroelectric Materials and Their Applications (FMA20)*, Kyoto, Japan, May (2003).
107. "Temperature dependence of the electromechanical properties of PZT thin films," *20th Meeting on Ferroelectric Materials and Their Applications (FMA20)*, Kyoto, Japan, May (2003).
108. "Thickness effect on the pyroelectric properties of chemical solution derived PZT thin films for the PIR sensor devices," *20th Meeting on Ferroelectric Materials and Their Applications (FMA20)*, Kyoto, Japan, May (2003).
109. "Piezoelectric properties of PZT films for micro-sensors and actuators," *15h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (2003).
110. "Fabrication of isolated ferroelectric domains in nano-scale," *15h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (2003).
111. "Study on crystal structure of (111)-oriented Pt films using high resolution X-ray diffractometer," *15h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (2003).
112. "Piezoelectric and pyroelectric properties of PZT films by chemical solution deposition method," *12th Ferroelectric Material Properties Symposium*, Pusan, Korea, February (2003) **(Invited Presentation)**.
113. "Piezoelectric properties of PZT films by sol-gel method," *12th Ferroelectric Material Properties Symposium*, Pusan, Korea, February (2003).
114. "Scaling Issues of PZT capacitor stack for high density FeRAM devices," *4th Japan-Korea Conference on Ferroelectricity*, Osaka, Japan, August (2002) **(Invited presentation)**.
115. "Electromechanical properties of PZT films for MEMS applications," *4th Japan-Korea Conference on Ferroelectricity*, Osaka, Japan, August (2002).
116. "Piezoelectric and ferroelectric properties of PZT films for MEMS applications," *14h International Symposium on Integrated Ferroelectrics and 13th IEEE International Symposium on Applications of Ferroelectrics (Joint Conference),* Nara, Japan, June (2002).
117. "Scaling and performance issues of low temperature crystallized PZT thin films for high density FRAM devices," *14h International Symposium on Integrated Ferroelectrics and 13th IEEE International Symposium on Applications of Ferroelectrics (Joint Conference),* Nara, Japan, June (2002).
118. "Heat-treatment induced ferroelectric fatigue of Pt/SBT/Pt thin film capacitor," *14h International Symposium on Integrated Ferroelectrics and 13th IEEE International Symposium on Applications of Ferroelectrics (Joint Conference),* Nara, Japan, June (2002).
119. "Ferroelectric fatigue in sol-gel derived PZT thin films having Pt bottom and PtO_x top electrodes," *14h International Symposium on Integrated Ferroelectrics and 13th IEEE International Symposium on Applications of Ferroelectrics (Joint Conference),* Nara, Japan, June (2002).
120. "Recent progress in PZT films for high density FeRAM devices and MEMS devices," 1st Thin Films/Single Crystals Symposium, Seoul, Korea, November (2002).
121. "Microstructure development of ferroelectric thin film by annealing condition," *Korean Ceramic Society*, Suncheon, Korea, October (2002).
122. "PIR sensor with Si MEMS process," *3rd High Dielectric and Ferroelctric Devices/Materials Symposium*, Seoul, Korea, December (2001).
123. "Low temperature crystallized PZT thin films for high density FeRAM devices," *3rd High Dielectric and Ferroelctric Devices/Materials Symposium*, Seoul, Korea, December (2001).
124. "Heat-treatment induced ferroelectric fatigue of Pt/SBT/Pt thin-film capacitors," *3rd High Dielectric and Ferroelctric Devices/Materials Symposium*, Seoul, Korea, December (2001).
125. "Recent progress in PZT films for MEMS and high density FeRAM devices," *3rd High Dielectric and Ferroelctric Devices/Materials Symposium*, Seoul, Korea, December (2001) **(Invited presentation)**.
126. "Fatigue and Imprint of integrated PZT and BLT capacitors for high density FeRAMs," 1st FRAM Symposium, Gotemba, Japan, November (2001) **(Invited presentation)**.
127. "A Critical comparison of degradation phenomena in PZT, SBT, BLT thin films for high density FeRAM devices," 1st FRAM Symposium, Gotemba, Japan, November (2001).
128. "Low temperature crystallized PZT thin films for high density FeRAM devices," *Korean Ceramic Society*, Daejeon, Korea, October (2001).

129. "Degradation phenomena in PZT, SBT, BLT thin films for high density FeRAM devices," *Korean Ceramic Society*, Daejeon, Korea, October (2001) **(Invited presentation)**.
130. "Commercialization of emerging technologies in fine ceramics," *Korean Ceramic Society*, Daejeon, Korea, October (2001) **(Invited presentation)**.
131. "A critical comparison of degradation phenomena in PZT, SBT, BLT thin films for high density FeRAM devices," *10th International Meeting on Ferroelectricity (IMF10)*, Madrid, Spain, September (2001).
132. "New chemical solution derived high quality PZT thick films for MEMS and IR sensor devices," *10th International Meeting on Ferroelectricity (IMF10)*, Madrid, Spain, September (2001).
133. "Low voltage switching in $Pb(Zr_xTi_{1-x})O_3$ thin films," *13h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (2001).
134. "Electrode structures for reliable $Pb(Zr_xTi_{1-x})O_3$ ferroelectric thin film devices," *13h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (2001).
135. "Electrical properties of PZT thin films prepared on giant grained platinum electrodes," *13h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (2001).
136. "Low voltage switching in Ca- and Sr- doped PZT thin films," *3rd Asian Meeting on Ferroelectrics (AMF-3)*, Hong Kong, China, December (2000).
137. "Effects of electrodes on the electrical properties of ferroelectric devices," *1st Asian Meeting on Electroceramics (AMEC)*, Nagoya, Japan, October (2000).
138. "Giant grained platinum electrodes for ferroelectric devices application," 12th *IEEE International Symposium on Applications of Ferroelectrics (ISAF2000),* Honolulu, Hawaii, July (2000).
139. "The effects of preferred orientation on ferroelectric properties of PZT thin films," 12th *IEEE International Symposium on Applications of Ferroelectrics (ISAF2000),* Honolulu, Hawaii, July (2000).
140. "Simple stacked electrode structure for high density ferroelectric memory devices," 12th *IEEE International Symposium on Applications of Ferroelectrics (ISAF2000),* Honolulu, Hawaii, July (2000).
141. "The effect of IrO_2 thickness on ferroelectric properties of PZT thin films with IrO_2/Pt hybrid electrodes," 12th *IEEE International Symposium on Applications of Ferroelectrics (ISAF2000),* Honolulu, Hawaii, July (2000).
142. "The reliable PZT thin film capacitors with IrO_2/Pt hybrid electrode for high density nonvolatile memory devices," 12th *IEEE International Symposium on Applications of Ferroelectrics (ISAF2000),* Honolulu, Hawaii, July (2000).
143. "Piezoelectric properties of PZT thin film diaphragm structures," 12th *IEEE International Symposium on Applications of Ferroelectrics (ISAF2000),* Honolulu, Hawaii, July (2000).
144. "Spatial variation of ferroelectric properties in $Pb(Zr_{0.3},Ti_{0.7})O_3$ thin films studied by AFM," 12th *IEEE International Symposium on Applications of Ferroelectrics (ISAF2000),* Honolulu, Hawaii, July (2000).
145. "Phenomenological behaviors of fatigue and voltage offsets in PZT thin films," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1999) **(Invited presentation)**.
146. "Orientation effects in chemical solution derived PZT thin films on ferroelectric properties," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1999).
147. "Measurement and calculation of thin film PZT piezoelectric properties," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1999).
148. "Process and characterization of fully embedded foil-based PLZT thin films with base metal electrodes," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1999).
149. "Thickness dependence of piezoelectric properties of PZT thin films," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1999) **(Invited presentation)**.
150. "Compositional heterostructures and orientation effects in PZT films for nonvolatile memories," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1999).
151. "Piezoelectric analysis of $Pb(Zr_{1-x}Ti_x)O_3$ and $Sr_{0.8}Bi_{2.3}Ta_2O_9$ thin films using atomic force microscopy," *11h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (1999).
152. "What is the outlook for PZT films for low voltage NVM operation," *11h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (1999) **(Invited presentation)**.
153. "Thickness effects in chemical solution derived PLZT thin films on fatigue and imprint," *11h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (1999).
154. "Influence on imprint failure of $SrBi_2Ta_2O_9$ thin film capacitors," *11h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (1999).

155. "An optimized process for $SrBi_2Ta_2O_9$ thin films using a novel chemical solution deposition technique," *11h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (1999).
156. "Effects of Ca and Sr dopants in PLZT thin films for low voltage operation," *11h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (1999).
157. "Composition and thickness dependence of piezoelectric properties of $Pb(Zr,Ti)O_3$ thin films," *11h International Symposium on Integrated Ferroelectrics,* Colorado Springs, CO, March (1999).
158. "A critical review of the effect of composition, dopants and orientation on the properties of PZT heterostructures for nonvolatile memories," *2nd Asian Meeting on Ferroelectrics (AMF-2)*, Singapore, Singapore, December (1998) **(Invited presentation)**.
159. "Factors controlling the properties of PZT films for nonvolatile memories," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
160. "Ferroelectric properties of SBT thin films for non-volatile memory devices as a function of substrate," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
161. "Ferroelectric properties of new chemical solution derived SBT thin films for non-volatile memory devices," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
162. "Role of oxygen vacancies on thermally induced imprint behavior of PZT thin films," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
163. "Rhombohedral PZT by chemical solution deposition : Observation regarding orientation and fatigue," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
164. "In-situ mass spectroscopy of recoiled ions studies of degradation processes in $SrBi_2Ta_2O_9$ thin films during hydrogen gas anneal," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
165. "Mechanism of electrical polarization fatigue in $SrBi_2Ta_2O9$ thin films," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
166. "Thermally induced imprint in PZT and SBT thin films," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
167. "Factors influencing on the imprint and the fatigue of PZT thin films for NVRAM," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1998).
168. "Ferroelectric Memories-Problems and Solutions," *International Symposium on Applications of Ferroelectrics*, Montreux, Switzerland, August (1998) **(Invited presentation)**.
169. "Preparation and ferroelectric properties of highly (111) oriented PZT thin films with mixed composition layers," *10th International Symposium on Integrated Ferroelectrics,* Monterey, CA, March (1998).
170. "The role of sol-gel PLZT in the high density ferroelectric RAMS," *10th International Symposium on Integrated Ferroelectrics,* Monterey, CA, March (1998).
171. "The effect of heat-treatment methods on microstructure and ferroelectric properties of sol-gel PLZT," *10th International Symposium on Integrated Ferroelectrics,* Monterey, CA, March (1998).
172. "Low-temperature crystallization of triethanolamine modified sol-gel PZT thin films," *10th International Symposium on Integrated Ferroelectrics,* Monterey, CA, March (1998).
173. "Imprint and fatigue properties of PLZT thin films as a function of top electrode materials," *10th International Symposium on Integrated Ferroelectrics,* Monterey, CA, March (1998).
174. "The effect of sol-gel derived seed layer on microstructure and ferroelectric properties of sol-gel derived PLZT thin films," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1997).
175. "The Effect of RuO_2/Pt hybrid bottom electrode structure and ferroelectric properties of sol-gel derived PZT thin films," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1997).
176. "The ferroelectric properties and leakage current characterization of sol-gel PLZT," *9th International Meeting on Ferroelectricity (IMF10)*, Seoul, Korea, September (1997).
177. "Characterization of PLZT on platinum electrodes for high density FRAM application," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, December (1996).