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Researchgate: https://www.researchgate.net/profile/H_H_Wu

Google scholar citation:

https://scholar.google.com/citations?hl=en&user=6HJ9Sm0AAAAJ&view_op=list_works&sortby=pubdate



Education background

- 2011 – 2015 Ph.D. in Solid Mechanics
The Hong Kong University of Science and Technology,
Dissertation: Phase field simulations of ferroelectric materials
- 2008 – 2011 M.Phil. in Materials Science and Engineering,
University of Science and Technology Beijing,
Dissertation: Finite element analysis on deformation behavior of bulk amorphous alloys and their composites
- 2004 – 2008 B.Eng. in Material Processing and Control Engineering,
North China University of Water Resources and Electric Power,
Dissertation: The preparation technology research of new bulk metallic glass composite materials $Zr_{60}Ti_{14.67}Nb_{5.33}Cu_{5.56}Ni_{4.44}Be_{10}$

Research interests

- Multiferoic materials
- Nano energy and science
- Nonequilibrium statistical physics
- Phase transitions & critical phenomena
- Atomistic and first principles calculations
- Thermodynamics and kinetics of materials

Computer skills

C, Fortran, Matlab, Mathematica, Abaqus, Ansys, COMSOL Multiphysics, Tecplot, Origin, Adobe Photoshop, Adobe Illustrator, Adobe Premiere Pro CC, AutoCAD, GraphPad Prism, Inkscape, Linux, LAMMPS, VASP

Featured publications

1. **H. H. Wu**, J. M. Zhu and T. Y. Zhang. Pseudo-first-order phase transition for ultrahigh positive/negative electrocaloric effects in perovskite ferroelectrics. 16, 419–427, **Nano Energy** (2015).
2. **H. H. Wu**, J. M. Zhu and T. Y. Zhang. Double Hysteresis Loops and Large Negative and Positive Electrocaloric Effects in Tetragonal Ferroelectrics. 17, 23897-23908, **Physical Chemistry Chemical Physics** (2015).
3. **H. H. Wu**, J. M. Zhu, T. Y. Zhang. Size-dependent ultrahigh electrocaloric effect near pseudo-first-order phase transition temperature in barium titanate nanoparticles. 5, 37476-37484, **RSC Advances** (2015).
4. **H. H. Wu**, S. G. Cao, J. M. Zhu, and T. Y. Zhang. The frequency-dependent Behavior of a Ferroelectric Single Crystal with Dislocation Arrays. Accept. **Acta Mechanica** (2015).
5. **H. H. Wu**, J. Wang, S. G. Cao, L. Q. Chen, T. Y. Zhang. The unusual temperature dependence of switching behavior in a ferroelectric single crystal with dislocations. 23, 025004, **Smart Materials and Structures** (2014).
6. **H. H. Wu**, J. Wang, S. G. Cao, T. Y. Zhang. Effect of dislocation walls on the polarization switching of a ferroelectric single crystal. 102, 232904, **Applied Physics Letters** (2013).
7. **H. H. Wu**, J. Wang, S. G. Cao, L. Q. Chen, T. Y. Zhang. Micro-/macro-responses of a ferroelectric single crystal with domain pinning and depinning by dislocations. 114, 164108, **Journal of Applied Physics** (2013).
8. **H. H. Wu**, S. C. Ning, H. Huang, J. M. Zhu and T. Y. Zhang. An energy-based optimization of the crack surface potential in ferroelectric materials. *Prepared for Physical Review B*.
9. S. G. Cao, **H. H. Wu**, H. Ren, J. Wang, L. Q. Chen, J. Li, and T. Y. Zhang. Twin Engineering as a Universal Alternative to Morphotropic Phase Boundary in Ferroelectric Ceramics. 97, 404–412, **Acta Materialia** (2015).
10. Y. Wu, **H. H. Wu**, X.D. Hui, G.L. Chen, Z.P. Lu. Effects of drawing on the tensile fracture strength and its reliability of small-sized metallic glasses. 58, 2564–2576, **Acta Materialia** (2010).
11. J. Zhu, **H. H. Wu**, D. Wang, Y. Gao, Y. Wang, T. Y. Zhang. Crystallographic analysis and phase field simulation of microstructure evolution during martensitic transformation in multifunctional β -Ti alloy. To be Submitted. **Acta Materialia** (2015).
12. Y. Wu, H. Wang, **H. H. Wu**, Z. Y. Zhang, X. D. Hui, G. L. Chen, D. Ma, X. L. Wang, Z. P. Lu, Formation of Cu-Zr-Al bulk metallic glass composites with improved tensile properties, 59, 2928–2936, **Acta Materialia** (2011).

13. Y. H. Xiao, Y. Wu, Z. Y. Liu, **H. H. Wu**, Z. P. Lu. Effects of free volume and glass transition temperature induced by different cooling rates on the mechanical properties of a Ti-based bulk metallic glass. 3, 394–398, **Sci China Phys Mech Astron.** (2010).

Research experience

- ❖ Apr. 2013–Aug. 2013 Visiting scholar, Pennsylvania State University, USA, working with Prof. Long-Qing Chen
 - Investigated the effect of temperature on the performance of ferroelectric single crystal
 - Developed a numerical method to study the effect of $\{1\ 1\ 1\}$ deformation twin on the properties of ferroelectric polycrystalline materials

- ❖ Aug. 2011–Jul. 2015 Research Associate, Hong Kong University of Science and Technology, working with Prof. Tong-Yi Zhang
 - Proposed two novel concepts of pseudo-first-order phase transition and electric-field-induced-pseudo-phase transition, both associated with ultrahigh negative and positive electrocaloric effect, to show the potential means to improve the electrocaloric effect in ferroelectric materials
 - Illustrated the influences of dislocation walls on the micro-structure signature and the macro-response of a ferroelectric single crystal in terms of the dislocation linear density, applied electric field amplitude, bias field, temperature and frequency.
 - Introduced a novel surface energy potential to study the fracture behavior of single crystal ferroelectric materials. When the surface energy potential is added into the existing energetic phase field approach, one can simulate brittle fracture and polarization evolution simultaneously.
 - Investigated the role of $\{1\ 1\ 1\}$ lattice twins in the polarization switching of both single grain and polycrystalline ferroelectric materials to explain and compare with the relevant experimental results in our own group.

- ❖ Apr. 2011–Jul. 2011 Visiting student, Zhejiang University, China, working with Prof. Jie Wang
 - Studied the pinning/depinning phenomena of defects in ferroelectrics
 - Investigated the effect of deadlayers on the properties of ferroelectrics

- ❖ Sept. 2008- Mar.2011 Research Associate, University of Science and Technology Beijing, working with Prof. Zhaoping Lu
 - Wrote a constitutive model code to investigate the mechanical and deformation behavior of bulk metallic glasses and their composites
 - Utilized multiple laboratory techniques and responsible for experimental data collecting and processing by software
 - Operated some experimental equipment skillfully: such as XRD, DSC, etc.

- ❖ Sept. 2009–Oct.2009 Visiting student, University of Science and Technology of China,

working with Prof. Yu Wang

- Developed a finite element program to study the shear bands in bulk metallic glasses

Honors and awards

- Oversea Research Awards to the Pennsylvania State University (2013)
- Excellent thesis prize for postgraduate student (2011)
- Excellent honor undergraduate prize for graduation in Henan Province (2008)
- National inspirational scholarship (2008)
- Excellent undergraduate student prize in Henan Province (2007)
- Grand Prize in Undergraduate Mathematical Contest in Modeling (2006)
- First prize in National Undergraduate Mathematical Contest in Modeling at Henan Division (2006)

Reviewer service

- Journal of Alloys and Compounds;
- Journal of Applied Physics;
- Materials Letters;
- Intermetallics;

US Patent

Twin Engineering to Improve the Switability and Rotability of Polarizations and Domains in Ferroelectric and Piezoelectric Materials. Reference code: TTC.PA.0823

Conferences

1. **H. H. Wu**, J. M. Zhu, T. Y. Zhang. Oral Presentation. Size-dependent ultrahigh electrocaloric effect near pseudo-First-Order Phase Transition Temperature in Ferroelectric Nanoparticles. The Chinese Congress of Theoretical and Applied Mechanics. Shanghai, China.
2. **H. H. Wu**, S. G. Cao, T. Y. Zhang. Oral Presentation. Effect of {111} lattice twin on the properties of ferroelectrics: a phase field study. Chinese Material Annual Meeting. Guiyang, China.
3. **H. H. Wu**, S. G. Cao, J. M. Zhu, T. Y. Zhang. Oral Presentation. The frequency-dependent behavior of a ferroelectric single crystal with dislocation arrays. The Fourth Asian Conference on Mechanics of Functional Materials and Structures, Nara, Japan.
4. **H. H. Wu**, J. Wang, S. G. Cao, L. Q. Chen and T. Y. Zhang. Oral Presentation. Effect of dislocation walls on the polarization switching of a ferroelectric single crystal. The 5th Asia Pacific Congress on Computational Mechanics and the 4th International Symposium on Computational Mechanics, Singapore.

5. Y. Wu, **H. H. Wu**, Z. P. Lu, Oral Presentation. Effects of drawing on tensile strength and reliability of metallic glassy wires, the First International Conference on Mechanical Properties of Materials, Hangzhou, China.
6. Y. Wu, **H. H. Wu**, Z. P. Lu, Oral Presentation. Effects of drawing on the tensile fracture strength and its reliability of small-sized metallic glasses. C-MRS Meeting, Changsha, China.
7. S. G. Cao, **H. H. Wu**, T. Y. Zhang. Oral Presentation. Reduced coercive field and enhanced polarization via strained nanotwinning. Materials Today Asia conference, Hong Kong.
8. S. G. Cao, **H. H. Wu**, T. Y. Zhang. Oral Presentation. Reduced coercive field and enhanced polarization via strained nanotwinning. International Symposium on Modern Topics in Ferroelectrics 2014 (ISMTF 2014), Changsha, China.

References

Prof. Tong-Yi Zhang, Ph.D. Advisor

Member, Chinese Academy of Sciences,

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