

Krishnendu Haldar

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Research Interests

Nonlinear continuum mechanics, Multi-field interactions with matter in continuum scale, Active materials and smart structures, Phase transformation, Computational mechanics, Phase field methods, Multi scale methods.

Education

Ph.D. Aerospace Engineering, Texas A&M University, College Station, Texas USA (December 2012).

Dissertation: “Magneto-thermo-mechanical coupling, stability analysis and phenomenological constitutive modeling of magnetic shape memory alloys (MSMAs)”, Advisor: Dr. Dimitris C. Lagoudas, GPA: 3.925/4.

M.S. Aerospace Engineering, Indian Institute of Technology, Kanpur, India (2005).

Thesis: “A finite elasticity formulation based framework for analysis of cable and membranes”, Advisor: Dr. C. S. Upadhyay, CPI (Cumulative Performance Index): 8.25/10.

B.E. Mechanical Engineering, Jadavpur University, Kolkata, India (2002). Percentage: 71/100.

Professional Experience

- 2013–now Institute of Mechanics, TU Dortmund, Germany –Postdoctoral Research Fellow.
Material modeling and computational finite deformation magnetomechanics for magnetoactive polymers.
- 2007–2012 Texas A&M University, College Station, Texas USA – Graduate Research Assistant.
Ph.D. level coursework and research.
- 2006–2007 Texas A&M University, College Station, Texas USA – Graduate Teaching Assistant.
Engineering Mechanics (Freshman course).
- 2005–2006 Indian Institute of Technology, Kanpur, India –Research Assistant.
Consulting project: Development of FEA code for fluid structure interaction problem of parachute system.
- 1998–1999 Indian Institute of Technology, Kanpur, India–Graduate student.
MS research and coursework.

Selected Graduate Level Courses

Methods in applied maths, Mathematical foundation of continuum mechanics, Micromechanics, Perturbation methods, Mechatronics system dynamics, Modeling of phase transformation (Phase field methods), Nonlinear FEA, Inelastic system, Theory of elasticity, Electromagnetic theory, Rigid body mechanics and vibration, Nonlinear vibration.

Refereed Publications

1. K. Haldar, B. Kiefer, D.C Lagoudas. *FE-Analysis of the Demagnetization Effect and Stress Inhomogeneities in MSMA Samples*, Philosophical Magazine, DOI: 10.1080/14786435.2011.602031, 2011.

2. K. Haldar, G. Chatzigeorgiou, D.C Lagoudas. *Stability Analysis of Magnetostatic Boundary Value Problems for Magnetic SMAs*, Journal of Intelligent Material Systems and Structures, Vol. 21, 2010, pp.1103-1116.

Submitted Papers

1. K. Haldar, D.C Lagoudas. *Constitutive Modeling of Magnetic Shape Memory Alloys with Discrete and Continuous Symmetries*, 2013.
2. K. Haldar, D.C Lagoudas, I. Karaman *Magnetic Field-Induced Martensitic Phase Transformation in Magnetic Shape Memory Alloys: Modeling and Experiments*, 2012.

Paper in Preparation

1. K. Haldar, G. Chatzigeorgiou, and D.C Lagoudas. *Stability Analysis of Magneto-Mechanical Coupled Boundary Value Problems for Magnetic SMAs*

Conference and Proceeding Presentations

1. K. Haldar, B. Kiefer, and D.C Lagoudas. *Finite Element Analysis of Stress Inhomogeneities in MSMA Samples Caused by Magnetic Body Forces and Couples*, 3rd International Conference on Ferromagnetic Shape Memory Alloys, Dresden, 18.-22.07.2011
2. K. Haldar, D.C Lagoudas. *Model Predictions of Strain and Magnetization under Magneto-Thermo-Mechanical Loading Paths in MSMAs*, SPIE Smart Structures/Nondestructive Evaluation Conference, San Diego, CA, March 9, 2011.
3. K. Haldar, D.C Lagoudas, B. Basaran, I. Karaman. *Constitutive Modeling of Magneto-thermo-Mechanical Response of Field-Induced Phase Transformations in NiMnCoIn Magnetic Shape Memory Alloys*, Proceedings of ASME 2010 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, SMASIS 2010, September 28 - October 1, 2010, Philadelphia, PA.
4. D.C Lagoudas, K. Haldar, B. Basaran, I. Karaman. *Constitutive Modeling of Magneto-Mechanical Coupling Response of Magnetic Field-Induced Phase Transformations in NiMnCoIn Magnetic Shape Memory Alloys*, SPIE Smart Structures and Materials/NDE Conference, San Diego, March 7-11, 2010.
5. G. Chatzigeorgiou, K. Haldar, D.C Lagoudas. *Stability of the Magnetomechanical Problem in Magnetic Shape Memory Alloys*, SPIE Smart Structures and Materials/NDE Conference, San Diego, March 7-11, 2010. Vol. 7644, 76440Y.
6. K. Haldar, D.C Lagoudas, B. Basaran, I. Karaman. *Modeling of Magnetic Field-Induced Phase Transformations in NiMnCoIn Magnetic Shape Memory Alloys*, The 2009 Joint ASCE/ASME/SES Conference on Mechanics and Materials, Blacksburg, VA, June 24-27, 2009.
7. D.C. Lagoudas, B. Kiefer, and K. Haldar. *Magnetic field-induced reversible phase transformation in magnetic shape memory alloys*, Vol. 7289, 72891O, 2009 SPIE San Diego, CA, March 8-12, 2009.
8. D.C. Lagoudas, B. Kiefer, and K. Haldar. *Magneto-Mechanical Finite Element Analysis of Magnetic Shape Memory Alloys with body Force and Body Couple*, ASME Smart Materials, Adaptive Structures and Intelligent Symposium, SMASIS08-533, Elliott City, MD, October 28-30, 2008.

Computer Skills

FEA Package: COMSOL multi physics, FEAP. Languages: MATLAB, FORTRAN,C. Operating Systems: Windows, Unix/Linux.