

Deepak Sharma, PhD

4th Main, KGE Layout, New Bel Road
Bangalore, India, 560094
Email: dsharma7309@gmail.com
Phone: (+91) 8861544361
Webpage: <https://sites.google.com/site/deepaksharmadehra/>

SUMMARY

PhD candidate trained in mechanical behavior of materials with special expertise in the following areas:

- Fracture Mechanics
- Thermal Interface Materials
- Experimental Design
- Data Analysis
- CAD and Finite Element Method
- Experimental Characterization

EDUCATION

Indian Institute of Science

Ph.D with MSc(Engg.), Materials Engineering, CGPA 6.3/8

Bangalore, KA, India

April 2018

- Ministry of Human Resource Development (MHRD) Research Fellowship

National Institute of Technology

B.Tech., Mechanical Engineering, CGPA 7.61/10

Hamirpur, HP, India

May 2011

RESEARCH EXPERIENCE

Indian Institute of Science, Department of Materials Engineering

Bangalore, KA

August 2012 - July 2017

➤ Ph.D. Student

Supervisor: Dr. Praveen Kumar

PhD Project: Synergistic effect of electromagnetic forces on the failure of pre-cracked thin metallic structures

- Finite element method (FEM) simulations were conducted showing fracture can occur due to electromagnetic forces.
- Designed custom-built fixture to investigate fracture in thin foil under electric current and mechanical loadings.
- Experiments successfully showed fracture due to self-induced electromagnetic forces which validated FEM results.
- Identified fracture mechanism due to electromagnetic forces through microstructural characterization (SEM, EDX).

➤ Senior Research Associate

August 2017 -present

- Characterization and development of (CNT or rGO)-Cu-In based new generation thermal interface materials.
- FEM analysis of the effect of electric field on the mechanical behavior of CNT foams.
- FEM analysis of the effect of electric current crowding in the bleach structure used to study electromigration.

TEACHING EXPERIENCE

Indian Institute of Science, Department of Materials Engineering

Bangalore, KA

Teaching Assistantship

Mechanical Behaviour Lab

Fall 2015

- Conducted tension test for undergraduate students (Class of 30 students).
- Graded lab files and conducted lab examination.

Mechanical Behaviour Course

Fall 2014

- Conducted Mechanical Behaviour Course tutorials for graduate students (Class of 30 students)
- Graded quiz and conducted examinations.

TECHNICAL SKILLS

- Computer aided design : AutoCAD, Solid Edge, Solid Works
- FEM and mathematics tools: COMSOL, ANSYS, ABAQUS, MATLAB
- Experimental characterization: SEM, TEM, EPMA, XRD, EDX, RAMAN SPECTROSCOPY

INTERNSHIPS AND WORKSHOPS

- Goa Shipyard Ltd., Jun-Jul 2009, Goa, India
- Western India Shipyard Ltd., Jun-Jul 2010, Goa, India
- Workshop on COMSOL Multiphysics, December, 2012, Bangalore, India
- Workshop on COMSOL Multiphysics, January, 2015, Bangalore, India

REFEREED PUBLICATIONS

1. **D. Sharma**, S. B. Reddy, and P. Kumar, "Electromagnetic force induced fracture of pre-cracked thin metallic conductors," *International Journal of Fracture*, <https://doi.org/10.1007/s10704-018-0299-2>, 2018.
2. **D. Sharma**, S. B. Reddy, and P. Kumar, "Fracture of Pre-Cracked Metallic Conductors under Combined Electric Current and Mechanical Loading," *International Journal of Fracture*, <https://doi.org/10.1007/s10704-018-0298-3>, 2018.
3. **D. Sharma**, A. Jain, N. Somaiah, R. Sharma, P.R. Narayanan, P. Kumar, "Effect of Embedding Cu-Graphene Hybrid Powder into 2-Phase In-Cu Solders on Its Suitability as Metallic Thermal Interface Material" *Journal of Electronic Materials*, 47, Issue 8, pp 4863–4874, 2018.
4. **D. Sharma**, R.K. Tiwari, R. Sharma, P.R. Narayanan, P. Kumar, "Two-Phase Metallic Thermal Interface Materials Processed through Liquid Phase Sintering followed by Accumulative Roll Bonding," *IEEE Trans. Compon. Pack.*, 6, Issue 1, pp 58–66, 2015.
5. N. Somaiah, **D. Sharma**, P. Kumar, "Electric Current Induced Forward and Anomalous Backward Mass Transport" *Journal of Physics D Applied Physics*, 49 20LT01, 2016.
6. Sil, A. A. Wagh, **D. Sharma**, R. Ranjan, and P. Anil Kumar, "On the inter-layer magneto-electric coupling in BiFeO₃/SrRuO₃ heterostructure," *Applied Physics Letters*, vol. 111, p. 102902, 2017.
7. P. Jagtap, S. K. Reddy, **D. Sharma** and P. Kumar, "Tailoring Energy Absorption Capacity of CNT Forests through Application of Electric Field" *Carbon*, vol. 95, pp 126-136, 2015.

CONFERENCES

1. **D. Sharma** and P. Kumar, "Synergistic Effect of Electromagnetic Forces On the Fracture of Pre-Cracked Thin Metallic Structures" *14th International Conference on Fracture (ICF 14)*, Rhodes, Greece, 18th-23rd June 2017.
2. **D. Sharma** and P. Kumar, "Transition of sharp crack propagation to blow hole formation in a pre-cracked thin conductor under short duration electric current pulses" *NMD-ATM*, Goa, India 11th - 14th November, 2017 (**Best contributory presentation award**).
3. **D. Sharma** and P. Kumar, "Graphene Nano-Sheet Cu Embedded 2-Phase In-Cu Solders as Next Generation Thermal Interface Materials" *IUMRS-ICYRAM*, IISc, Bangalore, India, 11th-15th December, 2016.
4. **D. Sharma**, R.K.Tiwari and P. Kumar, "A Novel Two Step Processing Route for Fabricating 2-Phase Metallic Thermal interface Materials" *IIM-NMD-ATM*, Coimbatore, 13th-16th November, 2015.

PERSONAL DETAILS

Sex: Male

Date of Birth: February 09, 1989

Marital Status: Married

Nationality: Indian