

Tianlei Xu

EDUCATION

Xi'an Jiaotong University

03/2022 – Present

Ph.D. candidate in Electrical Engineering | Research with Prof. Zongren Peng

Research of interests: space charge, insulating material, quantum chemistry calculation and finite element modeling

Xi'an Jiaotong University

09/2020 – 12/2021

Master candidate in Electrical Engineering | Research with Prof. Zongren Peng

Chongqing University

09/2016 – 06/2020

Bachelor in Electrical Engineering and Automation | GPA: 3.7/4.0

MAIN PUBLICATIONS

[J1] **Tianlei Xu**, Qingyu Wang, Shunxi Song, Meiyun Zhang, Zongren Peng, Peng Liu, Zongliang Xie and Rui Wang. A potential substitute for traditional insulating paper: low-ash paper processed from natural bamboo. *IEEE Transactions on Dielectrics and Electrical Insulation*. (Early Access)

[J2] **Tianlei Xu**, Qingyu Wang, Shunxi Song, Meiyun Zhang, Zongren Peng and Peng Liu. Preparation and performance analysis of bamboo insulating paper/epoxy composites. *High Voltage Engineering*, 2023, 49(11): 4535-4546. (in Chinese)

[J3] Xi Pang, **Tianlei Xu**, Peng Liu, Dingxin Wei, Zongliang Xie and Zongren Peng. Space charge simulation for basin insulator of high voltage DC GIL under temperature gradient. *High Voltage Engineering*. (Early Access, in Chinese)

[J4] Zongliang Xie, Xi Pang, **Tianlei Xu**, Peng Liu, Dingxin Wei, Jingxin Wang, Zehua Wu, He Li, and Zongren Peng. Space charge dynamics of epoxy/micro- Al_2O_3 composites under multi-physical fields, *Journal of Physics D: Applied Physics*, 2023, 56, 344005.

[J5] Peng Liu, Xi Pang, Zongliang Xie, **Tianlei Xu**, Shifeng Shi, Peng Wu, He Li and Zongren Peng. Space charge characteristics in epoxy/nano-MgO composites: Experiment and two-dimensional model simulation, *Journal of Applied Physics*, 2022, 132, 165501.

[J6] Peng Liu, Zongliang Xie, Xi Pang, **Tianlei Xu**, Siyu Zhang, Peter H. F. Morshuis, He Li and Zongren Peng. Space charge behavior in epoxy-based dielectrics: progress and perspective. *Advanced Electronic Materials*, 2022, 8(10):2200259.

[J7] **Tianlei Xu**, Xi Pang, Zongliang Xie, Peng Liu and Zongren Peng. Research on interface charge behavior and electrical threshold in layered epoxy/paper composites: from experimental to simulation, *High Voltage*. (Submitted)

[C1] **Tianlei Xu**, Weiyu Wang, Xi Pang, Zhiwei Ye, Chongchong Chen, Peng Liu, Zongren Peng. Research on temperature dependent threshold of epoxy/paper composites through space charge measurements, *2021 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP)*, 251-254.

[C2] Tianwei Ren, Jing xin Wang, Zongliang Xie, **Tianlei Xu**, Xi Pang, Peng Liu, Zongren Peng. Effect of electrode material type on space charge characteristics in polymers, *2022 IEEE 4th International Conference on Dielectrics (ICD)*, 577-580.

RESEARCH EXPERIENCE

Space charge Threshold of Epoxy/Paper Composites

09/2020 – 06/2021

- Design of a space charge testing equipment capable of doing measurements under electro-thermo-mechanical coupling conditions;
- Measurement of the space charge dynamics in epoxy/paper composites under various electric fields and temperatures, obtaining charge threshold-temperature relationship.

Thermo-mechanical Properties of nano- Al_2O_3 /Epoxy Composites

09/2021 – 06/2022

- Measurements of glass transition temperature, thermal conductivity and mechanical modulus of nano- Al_2O_3 /epoxy composites to investigate into the effect of doping rate on thermo-mechanical properties;

- Analysis of influencing mechanism of doping rate on thermo-mechanical properties by molecular dynamics simulation.

Properties of Low-ash Bamboo Paper and its Epoxy Composites

09/2022– 06/2023

- Propose of a way to derive low-ash bamboo paper with great thermal stability and impregnation performance, making it a comparable substitute for traditional insulating wood paper;
- Fabrication of epoxy/bamboo paper composites with high electrical strength and low dielectric loss, making its properties similar to or even better than epoxy/wood paper composites.

Space charge Simulation of Epoxy/Paper Composites

09/2023 – Present

- A modified bipolar carrier model to simulate the space charge distribution of epoxy/paper composites;
- Correction of model parameters through equivalent experiments (e.g., conduction current measurement, TSDC and UV-vis testing).

APPENDIX

Patents:

- Peng Liu, **Tianlei Xu**, Zongliang Xie, Xi Pang, Tianwei Ren and Yaqin Wen. A space charge measurement device and method considering electro-thermo-mechanical coupling [P]. Shaanxi Province: CN113866525B, 2023-12-19. (in Chinese)

Technical Skills:

- Languages: Mandarin (Native) & English (WSK Qualified)
- Programming: MATLAB, COMSOL, Gaussian, Materials Studio

Honors & Rewards:

- The First Prize Scholarship, Xi'an Jiaotong University, 2021.
- Freshman scholarship, Xi'an Jiaotong University, 2020.
- Excellent Student, Chongqing University, 2019.
- Honorable Mentions, The Mathematical Contest in Modeling, 2018.
- Freshman scholarship, Chongqing University, 2016.