[Carrier Transport and Molecular Displacement Modulated dc Electrical Breakdown of Polypropylene Nanocomposites]( https://www.mdpi.com/2073-4360/10/11/1207/pdf).

[Thickness-Dependent DC Electrical Breakdown of Polyimide Modulated by Charge Transport and Molecular Displacement.]( https://www.mdpi.com/2073-4360/10/9/1012/pdf)

This model can further be applied to the charge transport in other systems, not limiting to insulation material system, since regularity of charge behavior exists in any system with external electrical field applied. Currently, in our research group, this model is also modified and utilized in field of ultra high thermal conductivity and carrier migration in solid battery.

\*\*Dielectric property simulation of insulating material\*\*

Method of modeling on dielectric property of aging Silicone Rubber is proposed. Specifically, by fitting the spectra to theoretical equations, we separated different polarization processes at various frequencies and calculated the values of corresponding parameters like thermal expansion coefficient, swelling ratio, etc.. By utilizing the correlations among various parameters, polarization property and specific process of SiR was delineated. Additionally, paper investigated the influence of degradation on the dielectric constant at high frequencies, ion concentration, conductivity and trap distribution, illustrating the charge transport property in the bulk of SiR and revealed the hidden cause for polarization. More information can be seen in [Dielectric and Carrier Transport Properties of Silicone Rubber Degraded by Gamma Irradiation]( https://www.mdpi.com/2073-4360/9/10/533/pdf)

For your information, more my published papers can be found in:

- [Electrical breakdown of polymer nanocomposites modulated by space charges]( https://sci-hub.si/https://ieeexplore.ieee.org/abstract/document/8117403/)

- [Study on short-term dc breakdown and corona resistance mechanism of polyimide](https://scholar.google.com/scholar?hl=en&as\_sdt=0%2C5&q=Study+on+short-term+dc+breakdown+and+corona+resistance+mechanism+of+polyimide&btnG=)

- [Trap and carrier transport of pristine and aged silicone rubber by surface potential measurements]( https://sci-hub.si/https://ieeexplore.ieee.org/abstract/document/8088723/)

- [Surface trap and carrier transport of aged and pristine oil-paper under harmonic voltage by surface potential decay]( https://sci-hub.si/https://ieeexplore.ieee.org/abstract/document/8257540/)

- [Polypropylene nanocomposite for power equipment: a review]( https://digital-library.theiet.org/content/journals/10.1049/iet-nde.2018.0005)

- [Space-charge modulated electrical breakdown in polyethylene nanodielelctrics]( https://www.researchgate.net/profile/Daomin\_Min/publication/324266674\_Space-Charge\_Modulated\_Electrical\_Breakdown\_in\_Polyethylene\_Nanodielelctrics/links/5b87a90f4585151fd13bba47/Space-Charge-Modulated-Electrical-Breakdown-in-Polyethylene-Nanodielelctrics.pdf)

- [Effect of deep traps and molecular motion on dc breakdown of polyethylene nanocomposites]( https://sci-hub.si/https://link.springer.com/chapter/10.1007/978-3-030-31676-1\_102)

- [Numerical simulation on dc breakdown of polyimide based on charge transport and molecular chain displacement]( https://sci-hub.si/https://link.springer.com/chapter/10.1007/978-3-030-31676-1\_11)

- [Space charge accumulation in silicone rubber influenced by Poole-Frenkel effect]( https://www.matec-conferences.org/articles/matecconf/pdf/2018/97/matecconf\_icnfm2018\_01001.pdf)

- [ Accumulation of space charges in epoxy resin nanodielectrics influenced by Poole-Frenkel effect]( https://sci-hub.si/https://ieeexplore.ieee.org/abstract/document/8727336/)

- [Dielectric properties of aged and pristine oil-paper under harmonic voltage by frequency domain spectroscopy]( https://sci-hub.si/https://ieeexplore.ieee.org/abstract/document/8280219/)