



SMART GRID CENTER
TEXAS A&M ENGINEERING EXPERIMENT STATION

SGC WEBINAR

Recent Developments in Geomagnetic Disturbance Analysis and the Texas A&M Magnetometer Network

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Geomagnetic disturbances (GMDs) caused by solar coronal mass ejections can induce quasi-dc currents in the ac power grid, potentially leading to harmonics, transformer heating, and increased reactive power losses in the system. Voltage collapse has been recognized as the key risk posed by these geomagnetically induced currents (GICs) the grid. This talk will first briefly introduce GMD modeling and impacts on the grid, followed by an overview of existing industry standards and practices designed to address these issues. Models and tools created by Texas A&M researchers to enable studies required to meet these standards will be discussed. More recent modeling advancements pertaining to non-uniform electric fields and visualization, and improving GMD situational awareness will be presented. A key requirement for the latter is monitoring GMD associated parameters, such as the earth's magnetic field, and GICs flowing in transformers. To this end, our recent work in establishing the Texas A&M Magnetometer Network will be discussed. This enables applications such as real-time monitoring, model validation, with potential opportunities for creating control and mitigation applications based on this system. Innovative solutions are proposed for new problems such as GIC estimation, especially in light of sparse GIC measurements and electric field uncertainty.

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Register in advance at

<https://tamu.zoom.us/meeting/register/tjcpd02rrz0jGd0l6Pod1Ptv89e9etUvhggX>



Komal Shetye is an Associate Research Engineer – (PI Elig.), at the Texas Engineering Experiment Station (TEES), at Texas A&M University. Prior to this, she was working as Senior Research Engineer in the Information Trust Institute, at the University of Illinois at Urbana-Champaign (UIUC) from 2011 till 2017. She holds a B.Tech. in Electrical Engineering from the University of Mumbai (2009) and earned an MSEE in Power Systems (2011) from UIUC. She has worked on several projects with utilities such as BPA, AEP, ATC, ComEd, Entergy, and TVA. She has served as co-Investigator on projects funded by NSF, DOE, and ARPA-E to name a few. Her work has dealt with topics such as power system dynamics and stability, model validation, synchrophasors, synthetic networks, and assessing the impact of geomagnetic disturbances (GMDs) on the power grid. She has actively participated in the NERC GMD Task Force meetings since 2012. She has been invited to present

her work at panels, conferences, and provide tutorials at IEEE PES General Meetings, NASPI, American Geophysical Union, and IIT Bombay to name a few. She is a Senior Member of IEEE.