学際科学フロンティア研究所増本研究室特別講演会

Magnetic and Electric Control of Capacitive Behavior in Granular Solids

講演者：

Yang Cao (Hubei University)

2024. 8.1 13:30 -14:30

会場：
学際科学フロンティア研究所
(1F セミナー室)

主催：学際科学フロンティア研究所

概要：

Granular solids, composed of discrete particles, offer unique properties crucial for advancements in electronic, magnetic, and dielectric technologies. In this presentation, I will review the recent development of the Tunnel Magneto-Dielectric (TMD) effect, where magnetic fields modulate dielectric properties through tunneling processes. Understanding TMD involves examining the quantum mechanical tunneling of charge carriers and their impact on dielectric behavior.

Enhancing TMD response can be achieved through two-dimensional (2D) structures that effectively improve magnetic field sensitivity, and dopant engineering that achieves better performance. Modulating the frequency response of TMD band can be achieved by constructing gradient structures and layered structures. The Tunnel Electro-Magneto-Dielectric (TEMD) effect further integrates electric field modulation, offering insightful understanding of the electric and magnetic control of capacitive behavior, highlighting their potential for transformative applications and innovations in material science.