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Session A27: Atomic Structure, Lattice Properties, and Phase Transitions
8:00 AM–10:48 AM, Monday, March 2, 2020
Room: 404

Sponsoring Unit: FIAP
Chair: Nihar Pradhan

Abstract: A27.00001 : Electric Field-Induced Metal-to-Insulator Phase Transition in Few-Layered $MoSe_2$*

Abstract

View Presentation

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The Metal-Insulator phase transition (MIT) is one of the most interesting phenomena to study particularly in two-dimensional transition-metal dichalcogendes (TMDCs). A few recent studies[1,2] have indicated a possible MIT on MoS_2 and ReS_2, but the nature of the MIT is still enigmatic due to the interplay between charge carriers and disorder in 2D systems. We will present a potential MIT in few-layered $MoSe_2$ FETs based on four-terminal conductivity measurements. Conductivities measured in multiple samples strongly demonstrate the insulating-to-metallic-like phase transition when the charge carrier density increased above a critical threshold. The nature of the phase transition will be discussed with an existing theoretical model.

[1]B. H. Moon et al, Nat Commun. **2018**; 9: 2052. [2]N. R. Pradhan et al, Nano Lett. **2015**, 15, 12, 8377

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