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## **(POS-28) Higher-order electron-phonon interactions and their effect on the dielectric and thermal properties of strongly-correlated 2D Dirac crystals**

*Tuesday 20 June 2023 17:54 (2 minutes)*

The unique structure of two-dimensional (2D) Dirac crystals, with electronic bands linear in the proximity of the Brillouin-zone boundary and the Fermi energy, creates anomalous situations where small Fermi-energy perturbations critically affect the electron-related lattice properties of these systems.[1] We have studied the interaction of these electrons with acoustic phonons, where the phonon frequency is also linear in their wavenumber. We show that in these systems considering higher-order electron-phonon interaction terms is essential to understand many critical crystal properties, including the dielectric function and the thermal conductivity, which we will present as a function of temperature in the special case of graphene.

[1] Kazemian and Fanchini, J. Phys.: Condens. Matter 35 325601 (2023)

### **Keyword-1**

2D Dirac crystals

### **Keyword-2**

Thermal conductivity

### **Keyword-3**

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