

Abstract Submitted
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Interplay of charge density modulations and superconductivity¹

JASON W. SADOWSKI, K. TANAKA, Dept. of Physics & Engineering Physics, University of Saskatchewan — Although charge density waves (CDW) in transition metal dichalcogenides (TMDs) have been studied for over three decades, there is yet no consensus on the mechanism for CDW in two-dimensional TMDs. Moreover, the layered 2H-type TMDs which exhibit coexistence of CDW order and superconductivity (SC) present an intriguing opportunity for studying the interplay of SC and charge density modulations. In particular, 2H-NbSe₂ is most suitable for such investigation as its transition temperatures for CDW and SC are well separated, and as it is easy to cleave is ideal for surface-sensitive measurements. The relation between CDW and SC in this material is still under debate, with one experiment indicating an enhancement of SC by CDW [1] and another implying a competition of the two kinds of orders [2]. Motivated by these experiments, we study the effects of Fermi surface structure on CDW and its interplay with SC in terms of the Bogoliubov-de Gennes formalism.

[1] Kiss *et al.*, Nat. Phys. **3**, 720 (2007).

[2] Borisenko *et al.*, Phys. Rev. Lett. **102**, 166402 (2009).

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