

Abstract Submitted
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Novel Mechanism for the CDW phase transitions in TaSe₂ YUE CAO, ZHE SUN, QIANG WANG, Univ. of Colorado, Boulder, HELMUTH BERGER, Institute of Physics of Complex Matter, EPFL, Switzerland, DANIEL DESSAU, Univ. of Colorado, Boulder — In this talk, we will report our recent study of the classical charge density wave material TaSe₂. The rich variety of features observed, e.g. partial Fermi surface nesting, inhomogeneous gap opening, pseudogap and soft bosonic modes, suggest the profound underlying physics. Several nesting schemes are put forward in this talk, including the dog bone band nesting with itself, the dog bone with the Gamma pocket and the Gamma pocket with the K pocket. We employ a novel band-by-band technique to analyze the characteristic correlation functions for the CDW phase. We will compare the different nesting possibilities to reveal the driving force behind the normal – incommensurate CDW – commensurate CDW phase transitions. Moreover, this discussion will help to improve our understanding of the CDW and of the nesting picture in general.

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