Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

The effect of quantum fluctuations on charge ordered $NbSe_2$ JASPER VAN WEZEL, YEJUN FENG, JIYANG WANG, R. JARAMILLO, T.F. ROSENBAUM — Among materials displaying charge density wave order, $NbSe_2$ stands out because its ordering vector does not correspond to any obvious nesting properties of its Fermi surface or band structure. The well known Peierls mechanism is thus less effective in singling out an ordering vector for $NbSe_2$, and the transition is driven instead by an increase of the susceptibility over a wide range of wave numbers. As the CDW transition is suppressed towards zero temperature, such a broad susceptibility gives rise to quantum fluctuations with an equally broad span in wavelengths. Here, we examine the role of these quantum fluctuations as the critical point is approached. We compare our theoretical findings to recent measurements of the ordering wave vector of $NbSe_2$ under pressure and show that its properties can be understood as arising from the combined effect of the presence of quantum fluctuations and the coupling of the CDW order parameter to the lattice.

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Date submitted: 17 Nov 2010 Electronic form version 1.4