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Low Temperature Thermal Conductivity in Cuprate Superconductors Amidst Coexisting Charge Order: Part I - Bare Bubble Calculation ADAM DURST, Stony Brook University, SUBIR SACHDEV, Harvard University — We consider a d-wave superconductor (dSC) in which the superconductivity coexists with charge density wave (CDW) order of wavevector (π,0). While the nodes of the quasiparticle energy spectrum survive the onset of charge order, there exists a critical value of the CDW order parameter beyond which the quasiparticle spectrum becomes fully gapped. We perform a linear response Kubo formula calculation of thermal conductivity in the low temperature (universal) limit, where a simplified model of disorder has been employed and vertex corrections have been neglected. (Effects of self-consistent disorder and vertex corrections are discussed in a separate talk – Part II.) Results reveal the dependence of thermal transport on increasing CDW order parameter up to the critical value at which the quasiparticle spectrum becomes fully gapped and thermal conductivity vanishes. In addition to numerical results, closed-form expressions are obtained in the clean limit for the special case of isotropic Dirac nodes.

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