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High frequency thermal transport for the 2d Hubbard model[1]
LOUIS-FRANCOIS ARSENAULT, SYED HASSAN, ANDRE-MARIE TREMBLAY, Departement de Physique and RQMP, Universite de Sherbrooke — In order to calculate thermal transport coefficients of correlated systems when the Boltzmann equation is not applicable, Shastry [1] has developed a new theoretical approach. Although, in this theory, quantities such as the thermopower depend only upon the one particle Green's function, vertex corrections are included. The price to be paid is that only the high frequency limit is accessible. This may be adequate for aforementioned transport coefficients. Results for the triangular lattice t-J model and the 1d Hubbard model are already in the literature but there are no results for the 2d Hubbard model, the prototype of correlated electron systems. We thus applied the Shastry approach to the 2d Hubbard model using quantum cluster approaches that include CDMFT + exact diagonalization, Bethe's lattice DMFT + CTQMC and CDMFT + CTQMC. Results were obtained for the thermopower as a function of temperature (T), chemical potential (mu), and band structure. Since infinite frequency is reached differently in the t-J and in the Hubbard model, our results enable us to assess the degree to which infinite frequency is related to experimental results on DC transport. [1] B. Sriram Shastry, Phys. Rev. B 73, 085117 (2006)

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