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Properties of Holstein polarons at finite temperature

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We generalize the Momentum Average (MA) approximation to compute the finite temperature spectral functions of the Holstein polaron in an one-dimensional system. We validate our MA results in 1D against available numerical data from the density matrix renormalization group (DMRG) method and the finite-temperature Lanczos method, establishing the accuracy of the MA results which are obtained at a substantially lower computational cost. We use MA to to characterize the temperature range over which a coherent quasiparticle (the polaron) exists and we study the evolution with temperature of its effective mass and lifetime.

Keyword-1

holstein polarons

Keyword-2

thermal phonons

Keyword-3

momentum average

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