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Properties of Holstein polarons at finite temperatures

Saturday 7 June 2025 10:00 (15 minutes)

We generalize the Momentum Average (MA) approximation to compute the finite temperature spectral functions of the Holstein polaron in a one-dimensional system. We validate our MA results in 1D against available numerical data from density matrix renormalization group (DMRG) 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.

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