

Abstract Submitted
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The Green's Function of the Holstein Polaron GLEN GOODVIN, MONA BERCIU, GEORGE SAWATZKY, University of British Columbia — I will present a novel, highly efficient yet accurate analytical approximation for the Green's function of a Holstein polaron. It is obtained by summing all of the self-energy diagrams, but with each self-energy diagram averaged over the momenta of its free propagators. The result becomes exact for both zero bandwidth and for zero electron-phonon coupling, and is accurate everywhere in the parameter space. The resulting Green's function satisfies exactly the first six spectral weight sum rules. All higher sum rules are satisfied with great accuracy, becoming asymptotically exact for coupling both much larger and much smaller than the free particle bandwidth. Comparison with existing numerical data also confirms this accuracy. I will then use this approximation to analyze in detail the redistribution of the spectral weight as the coupling strength varies.

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