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Refinement of a Lanczos-based variational procedure to solve the Holstein model ZHOU LI, University of Alberta, DEVIN BAILLIE, Univeristy of Alberta, CINDY BLOIS, University of Toronto, FRANK MARSIGLIO, University of Alberta — We propose a slight refinement to the Trugman variational procedure to more efficiently solve the Holstein model with Lanczos methods. The modified Lanczos method converges much more quickly compared with the usual one in the intermediate- and strong- coupling regimes. To get a 6-digit accuracy of ground state energy at intermediate-strong coupling in the adiabatic region (small phonon frequency), only about 5000 basis states are need to be included. We also construct a variational ground state based on the numerical results.

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