The Anharmonic Electron-Phonon Problem [Phys. Rev. Lett. 77, 4588 (1996)]

J. K. Freericks, Mark Jarrell, and G. D. Mahan

[S0031-9007(97)03920-3]

An error has been found in the strong-coupling perturbation theory expansion, which now breaks electron-hole symmetry at fourth order. The revised results for the charge-density-wave (CDW) transition temperature at half filling are presented in Fig. 2. The approximation is more accurate for small anharmonicity, but does not predict the peak position too accurately.

Figure 4 includes the revised results off half filling. The perturbation theory has the right asymmetry, enhancing transition temperatures below half filling, and reducing them above half filling, but rapidly becomes inaccurate as the anharmonicity is increased.

We also forgot to add a reference to the quantum Monte Carlo algorithm used [1].

No conclusions are modified by these changes.

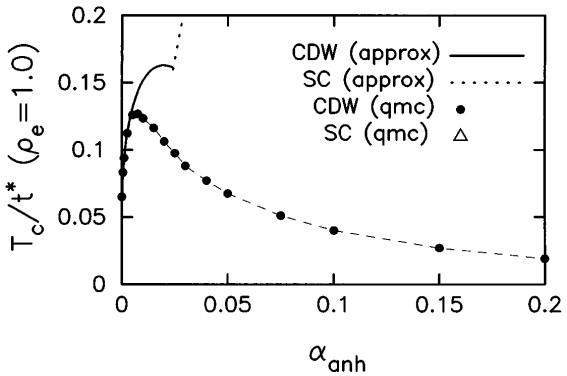

FIG. 2. Charge-density-wave transition temperature at half filling as a function of α_{anh}. The QMC results (dots—no SC transitions were found at half filling with the QMC) are compared to the strong-coupling perturbation theory for CDW order (solid line) and SC order (dotted line). The dashed line through the QMC points is a guide to the eye.

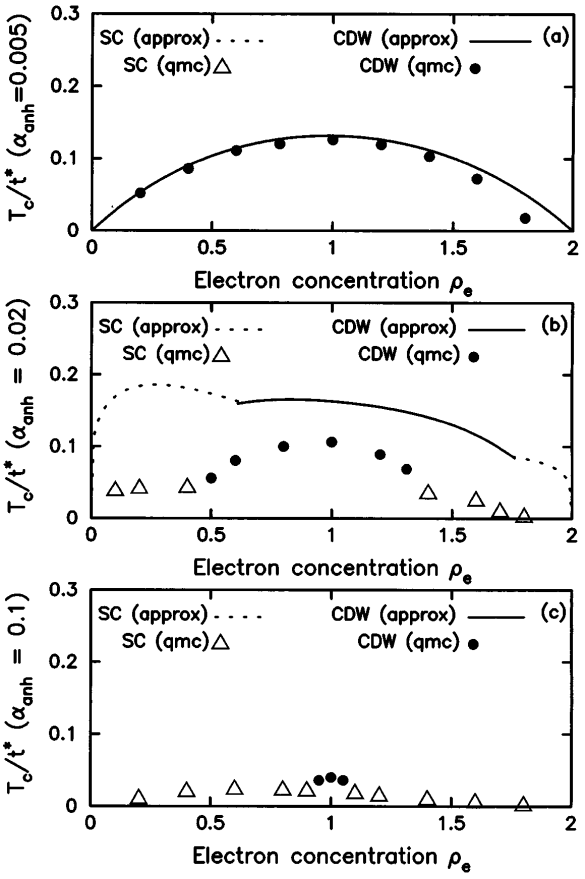

FIG. 4. Phase diagrams for the anharmonic Holstein model at three different values of α_{anh}: (a) 0.005, (b) 0.02, and (c) 0.1. The solid dots are CDW phases, the open triangles are SC phases. The solid lines are a strong-coupling approximation to the CDW T_c, and the dotted lines are a strong-coupling approximation to the SC T_c.

[1] J. E. Hirsch and R. M. Fye, Phys. Rev. Lett. **56**, 2521 (1986).

