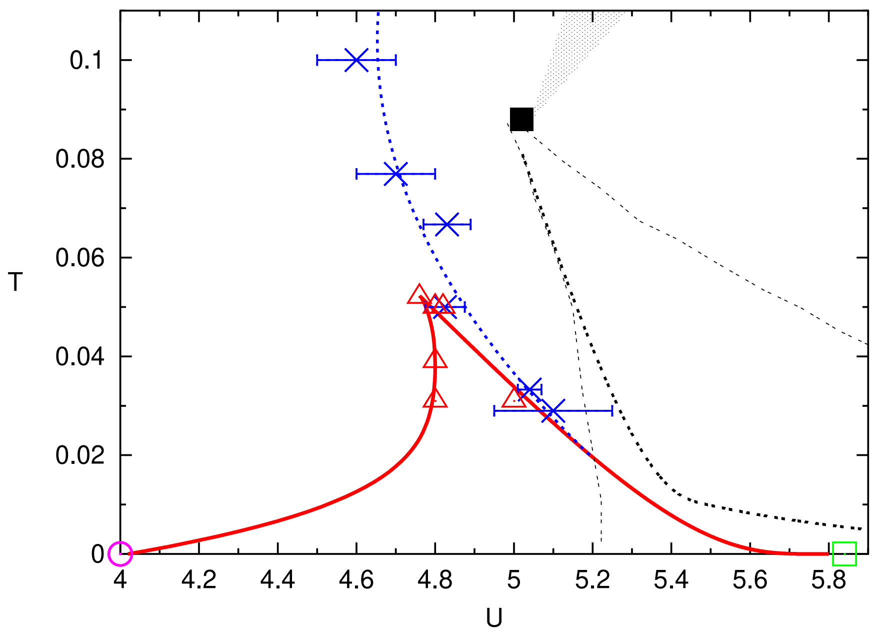

Figure 3.10: Status of the phase diagram of the fully frustrated Bethe lattice in summer 1999: QMC simulations (triangles) by Rozenberg et al. (1999) establish coexisting solutions for $T < 0.05$ on the metallic side of Schlipf et al.'s (1999) transition line. The solid lines indicate Kotliar's new suggestion for the coexistence region which should reach both the RDA point and the NRG/ED/PSCT point at $T = 0$ (cf. Fig. 3.9) and is considerably smaller and shifted in comparison with the IPT prediction (thin dashed lines).

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by Ulmke (our group), Krauth and Rozenberg (as published in the review Georges et al. (1996)), and Jarrell are compared in subsection 3.4.1. There, we will see that the "Ulmke" code contains an avoidable error proportional to the discretization $\Delta\tau$ which may prevent the detection of a second stable phase. This fact had not been caught before, since the algorithm is still correct for $\Delta\tau \to 0$ in single-phase regions (with increased numerical effort for the same accuracy). This deficiency will be cured in a modified scheme which brings the resulting code approximately on par with Krauth's code. Jarrell's code, however, will be seen to be still superior, in particular with respect to treating the Fourier transform. Therefore, the fact that Jarrell apparently missed a (small) coexistence region at $T = 1/30$ cannot be explained from the code alone. In subsection 3.4.2, we will identify the search strategy for converged solutions as the problem. Insight gained in this subsection will also put the numerical significance of Rozenberg et al.'s (1999) results in perspective. The final two subsections are more general: subsection 3.4.3 contains a discussion of errors and their estimation while subsection 3.4.4 shortly explains the MPI parallelization of the QMC code accomplished in this thesis.