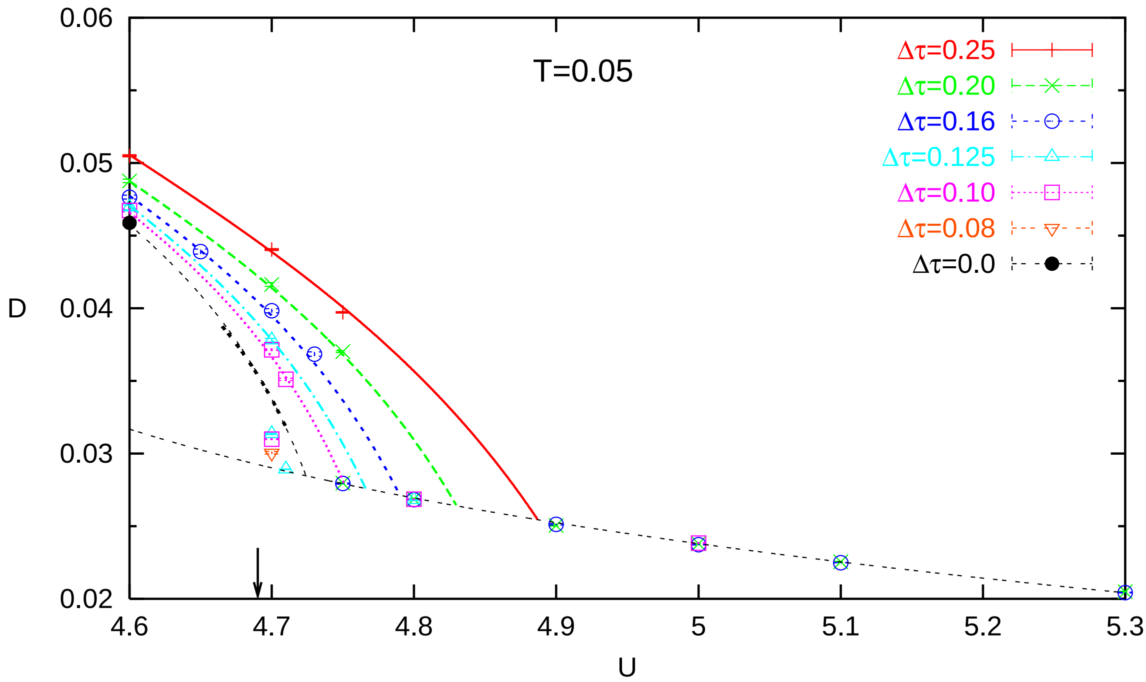

Figure 3.37: Double occupancy for $T = 1/20$. QMC data (symbols) and fit curves in analogy to Fig. 3.36. The extent of the "linearized" fit (thick curve) represents the width of the coexistence region (at $\Delta\tau = 0$). The arrow shows the estimate for U_c obtained in Sec. 3.6. The $\Delta\tau$ dependence of the QMC data for the insulator is significant only in the coexistence region at $U = 4.7$.

the fit curve for the insulating solution decreases significantly with decreasing $\Delta\tau$.[33] Therefore and in view of the behavior of D observed at lower T, it is still reasonable to assume that the $\Delta\tau = 0$ curve is correct also for the insulator. Further support for this scenario will arise from the shape of the coexistence region. As before, the thick double-dashed line corresponds to the linearized differential equation for $U_c(T)$ to be discussed in Sec. 3.6.[34] Here and in the following plots, the extent of the thick fit curve denotes the extent of the coexistence region. The arrow pointing towards the abscissa represents the estimate for U_c (for $T = 0.05$) to be derived in Sec. 3.6. It is included in this and the following plots in order to indicate the most important parameter region for each temperature; the accuracy of the final phase diagram will predominantly depend on small errors in ΔD and ΔE in these regions.

For $T = 0.04$, the good agreement between QMC data and fit functions is evident

[33] Obviously, the correct extrapolation could be found by performing additional, careful simulations at very small $\Delta\tau$. The computational cost, however, would be enormous even for going to $\Delta\tau = 0.05$ since the proximity of the stability edge requires using a much larger number of sweeps than needed at lower T (where up to 400 time slices were indeed used). Furthermore, the impact of the data at this high temperature on $U_c(T)$ is essentially local, i.e., will only affect it visibly within the tip of the coexistence region.

[34] The fact that this thick line closely matches the original fit for $\Delta\tau = 0.0$ (thin line) implies that no accuracy will be lost by the linearization.