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Addition/Correction

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Correction to Critical Point of Symmetric Binary Homopolymer Blends

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In some of the field-theoretic simulations (FTS) from our paper,[1] the Monte Carlo (MC) move that changes the average value of the $W_{-}(\mathbf{r})$ field was accidentally disabled, leading to poor statistics. Only a few of the results are significantly affected, but one of the main conclusions of the paper has changed. Here the simulations are repeated with the MC move enabled and a new semi-grand canonical ensemble that helps increase the computational speed and accuracy.[2]

Figure 3 shows the corrected cumulant calculations. The data for $\bar{N} = 10^5$ and 10^4 are close to those in the original paper; however, there is a notable difference in the crossing point for $\bar{N} = 10^3$. The collapse of the scaled curves, shown in Figure 4, is somewhat better than in the original paper, as a result of the improved statistics.

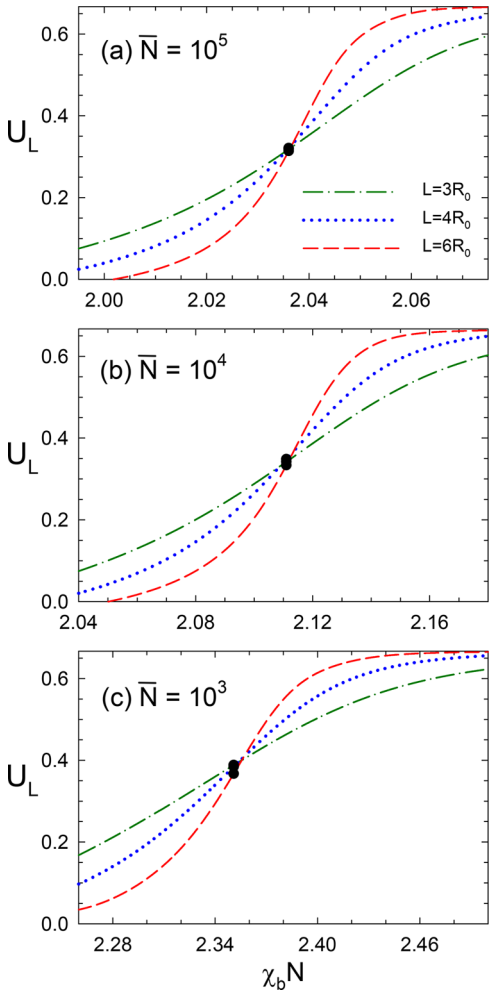

Figure 3. Fourth-order cumulant, U_L, calculated using different system sizes, L, for (a) $\bar{N} = 10^5$, (b) $\bar{N} = 10^4$, and (c) $\bar{N} = 10^3$. Simulations were conducted with a grid spacing of $\Delta = 0.5R_0$, and MC reweighting was performed about the points indicated by solid dots.

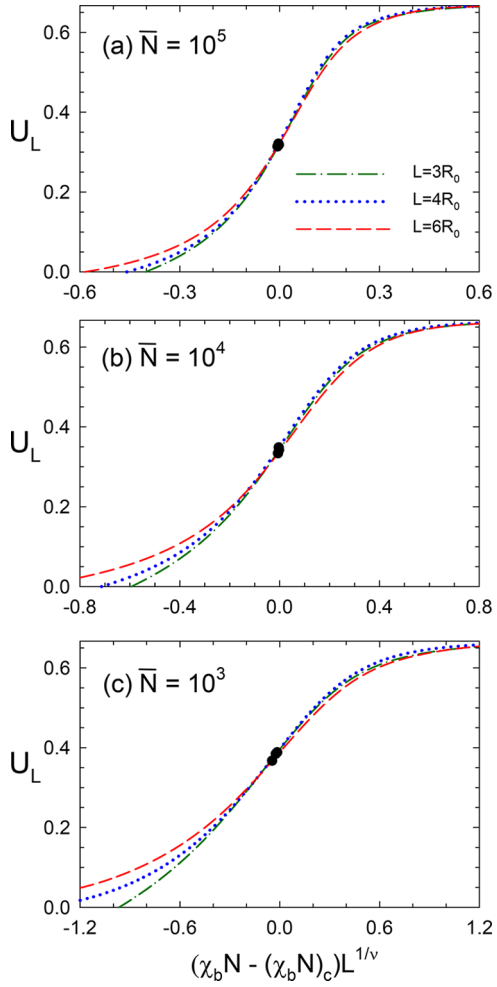

Figure 4. Analogous to Figure 3 but with the horizontal axes scaled using the 3D-Ising critical exponent, $\nu = 0.629\,97$.

Table 1 lists the critical points for different grid resolutions, Δ, in terms of the bare χ_b, and Figure 5 plots the data using two different effective χ_e's. Comparing to the original data, there is little change for $\bar{N} = 10^5$ and 10^4; however, there is a noticeable difference for $\bar{N} = 10^3$. As before, χ_{e1} removes the UV divergence for $\Delta \to 0$. Note that we did not repeat the

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Table 1. Critical points, $(\chi_b N)_c$, in Terms of the Bare χ_b, Calculated Using Different Grid Spacings, Δ, and Invariant Polymerization Indexes, $\bar{N}$

	$(\chi_b N)_c$		
Δ/R_0	$\bar{N} = 10^5$	$\bar{N} = 10^4$	$\bar{N} = 10^3$
0.75	2.025	2.075	2.230
0.5	2.036	2.112	2.359
0.375	2.046	2.147	2.503
0.25	2.067	2.221	2.852

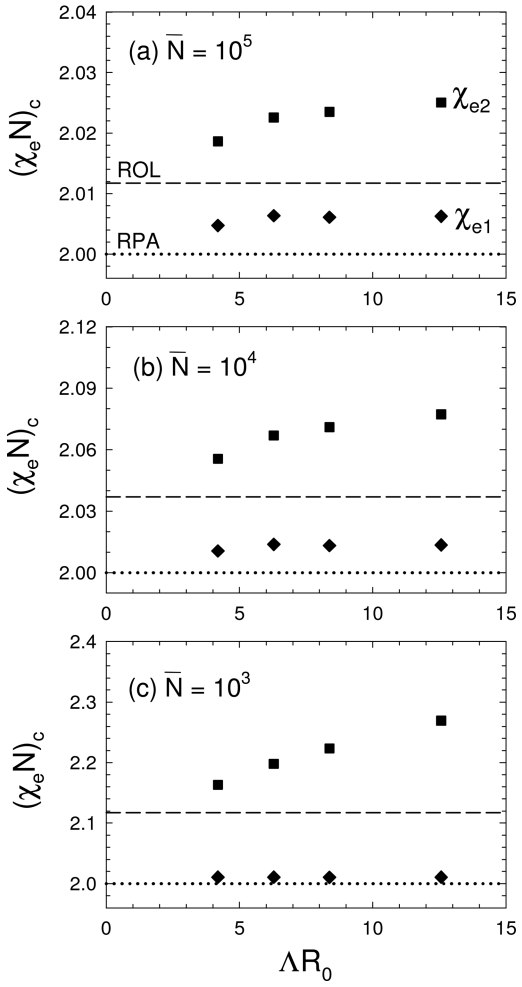

Figure 5. Critical point, $(\chi_e N)_c$, in terms of the effective χ_{e1} (diamonds) and χ_{e2} (squares) as a function of the wavevector cutoff, $\Lambda = \pi/\Delta$, calculated for (a) $\bar{N} = 10^5$, (b) $\bar{N} = 10^4$, and (c) $\bar{N} = 10^3$. The mean-field prediction of 2 and the renormalized one loop (ROL) prediction are denoted by the dotted and dashed lines, respectively.

highly computational calculation for $\Delta = 0.1875R_0$ because the asymptotic behavior is already established by $\Delta = 0.25R_0$.

Figure 6 compares the critical points with renormalized one loop theory (ROL), which predicts $(\chi N)_c \propto \bar{N}^{-1/2}$. The critical point for $\bar{N} = 10^3$ is below where it was in the original publication, now showing a substantial deviation from the $\bar{N}^{-1/2}$ scaling. This, in fact, happened in particle-based simulations[3] when a linear definition of the effective χ_e was employed. We are currently exploring a definition of χ_e that is nonlinear in χ_b, following the approach of ref 4.

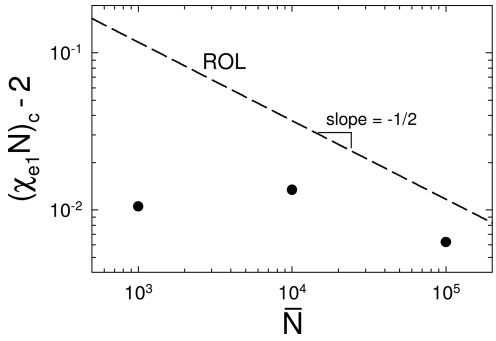

Figure 6. Logarithmic plot showing the fluctuation correction to the mean-field critical point for the three values of $\bar{N}$ simulated in this study. The dashed line denotes the ROL prediction.

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