

Reweighting method in finite density lattice QCD

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Abstract: Finite density simulations require dynamical fermions which are generally expensive computationally. When studying phase transitions we have to scan very finely both the temperature and density directions in the phase space; a large number of ensembles need to be generated. Ferrenberg and Swendsen showed that we can employ reweighting to reduce the number of ensembles needed. We tested their method on the ensemble generated by the Kentucky group using the canonical approach. We took the ensembles generated at $k = 0$ and $k = 3$ and used them to extrapolate to $k = 6$. The results of the extrapolation agreed with the results determined by using the $k = 6$ ensembles directly. We conclude that the method can be useful and we plan to use it to determine the phase boundary in our future studies.