

Application of the tempered Lefschetz thimble method to a chiral random matrix model

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Monte Carlo simulations of finite density QCD is plagued by the sign problem. The tempered Lefschetz thimble method (TLTM) [Fukuma-Umeda(1703.00861)] is a promising algorithm towards solving the sign problem, where the integration region is deformed into the complex space and the system is parallel-tempered with the flow time so as to solve both sign and ergodicity problems simultaneously. In this talk, we apply the TLTM to a chiral random matrix model, which models finite density QCD in the large N limit. We show that the TLTM correctly reproduces exact results for small N and discuss the scaling of the computational cost as N increases [Fukuma-NM-Umeda(in preparation)]. We also explain how to implement HMC algorithm to the TLTM [Fukuma-NM-Umeda(1912.13303)].

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