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A central limit theorem for adaptive and interacting Markov chains

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Adaptive and interacting Markov Chains Monte Carlo (MCMC) algorithms are a novel class of non-Markovian algorithms aimed at improving the simulation efficiency for complicated target distributions. In this paper, we study a general (non-Markovian) simulation framework covering both the adaptive and interacting MCMC algorithms. We establish a Central Limit Theorem for additive functionals of unbounded functions under a set of verifiable conditions, and identify the asymptotic variance. Our result extends all the results reported so far. An application to the interacting tempering algorithm (a simplified version of the equi-energy sampler) is presented to support our claims.

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