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Overcoming strong metastabilities with the LLR method

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It has been shown that the recently proposed LLR method is very efficient at overcoming strong metastabilities that arise near first-order phase transition points. Here we present a systematic study of the performance of the algorithm near (pseudo)critical points on q -state Potts models for q as large as 20, in two and three dimensions. In particular, we shall focus our study on the ergodicity of the replica exchange step and the underlying physical mechanism. Our results for thermodynamic observables (including interface tensions at criticality) are also discussed.

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