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Topology changing update algorithms for $SU(3)$ gauge theory

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At fine lattice spacings, lattice simulations are plagued by slow (topological) modes that give rise to large autocorrelation times. These in turn lead to statistical and systematic errors that are difficult to estimate. We study the problem and possible algorithmic solutions in 4-dimensional $SU(3)$ gauge theory, with special focus on instanton updates and metadynamics.

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