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Studying and removing effects of fixed topology

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At small lattice spacing, or when using e.g. overlap fermions, lattice QCD simulations tend to become stuck in a single topological sector. Physical observables, e.g. hadron masses, then differ from their full QCD counterparts by $1/V$ corrections, where V is the space-time volume. These corrections can be calculated order by order using the saddle point method. We calculate all corrections proportional to $1/V^2$ and $1/V^3$ and test the resulting equations for several models: an analytically solvable quantum mechanical model, the Schwinger model, and pure $SU(2)$ Yang Mills theory

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