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First dynamical simulations with minimally doubled fermions

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For thermodynamics studies it is desirable to simulate two degenerate flavors and retain chiral symmetry. Staggered fermions can achieve this by rooting the determinant. Rooting can be avoided using minimally doubled fermions. This discretization describes two degenerate quark flavors while explicitly breaking hypercubic symmetry, thus requiring additional counterterms. We use one particular formulation of minimally doubled fermions called the Karsten-Wilczek action and mitigate lattice artifacts by improving the spatial derivatives in the Dirac operator. In this pilot study we determine the counter terms non-perturbatively to facilitate proper dynamical simulations.

Topical area

Software Development and Machines

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