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## **Lattice QCD on non-orientable manifolds - part I**

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A common problem in lattice QCD simulations on the torus is the extremely long autocorrelation time of the topological charge, when one approaches the continuum limit. The reason is the suppressed tunneling between topological sectors. The problem can be addressed by replacing the torus with a different manifold. Here we propose to use a non-orientable manifold, and show how to define and simulate lattice QCD on it. Part I focuses on the motivation and general introduction of our construction.

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