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Canonical simulations of supersymmetric SU(N) Yang-Mills quantum mechanics

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The fermion loop formulation naturally separates partition functions into their canonical sectors. Here we discuss various strategies to make use of this for supersymmetric SU(N) Yang-Mills quantum mechanics obtained from dimensional reduction in various dimensions and present numerical results for the separate canonical sectors with fixed fermion numbers. We comment on potential problems due to the sign of the contributions from the fermions and due to flat directions. Finally, we discuss the possibility to extend the simulation strategies to higher dimensional gauge field theories, such as QCD.

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