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Transfer matrices and temporal factorization of the Wilson fermion determinant

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When lattice QCD is formulated in sectors of fixed quark numbers, the canonical fermion determinants can be expressed explicitly in terms of transfer matrices. This in turn provides a complete factorization of the fermion determinants in temporal direction. Here we present this factorization for Wilson-type fermions and provide explicit constructions of the transfer matrices. Possible applications of the factorization include multi-level integration schemes and the construction of improved estimators for generic n-point correlation functions.

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