Numerical Challenges in Lattice QCD 2022









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Temporal factorization of the Wilson fermion determinant and multi-level integration

Monday 15 August 2022 09:00 (40 minutes)

When lattice QCD is formulated in sectors of fixed quark numbers, the canonical fermion determinants can be expressed explicitely in terms of transfer matrices defined at fixed time. This in turn provides a complete factorization of the fermion determinants in temporal direction. In this talk I describe this factorization for Wilson-type fermions and present explicit constructions of the transfer matrices. Possible applications of the factorization include the construction of improved estimators for generic n-point correlation functions and multi-level integration schemes. The latter is of particular interest for the calculation of disconnected correlation functions.

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