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Canonical simulations of heavy-dense QCD without a sign problem

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In this talk I show how the canonical formulation of QCD can be obtained from transfer matrices defined directly in the canonical sectors of QCD. These transfer matrices are closely related to the dimensionally reduced Wilson fermion determinant and provide a complete temporal factorization of the fermion determinant. In the heavy-dense limit, the fermionic contributions to the canonical partition functions can be calculated analytically and I show that the sign problem is absent at infinitely strong coupling. Finally, I construct a cluster algorithm which solves the sign problem away from the strong coupling limit.

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