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Moving NRQCD

Moving NRQCD (mNRQCD) is Non-Relativistic Quantum Chromodynamics (NRQCD) formulated on a lattice which is boosted relative to the usual discretization frame. mNRQCD allows to treat the momentum for the heavy quark arising from the frame choice exactly. The action for mNRQCD has been derived through O(1/mˆ2,vˆ4), as accurate as the NRQCD action in present use, including O(aˆ4) improvements. We have carried out extensive tests of the formalism through calculations of two-point correlators for both heavy-heavy (bottomonium) and heavy-light (B_s) mesons in 2+1 flavor lattice QCD and obtained both perturbative and non-perturbative determinations of energy shift and external momentum renormalization. The results demonstrate the effectiveness of mNRQCD. In particular we show that the decay constants of heavy-light mesons can be calculated with small systematic errors up to much larger momenta than with standard NRQCD.

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