

Abstract Submitted
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Open Effective Field Theories from Deeply Inelastic Reactions¹

ERIC BRAATEN, Ohio State University, HANS-WERNER HAMMER, Technical University Darmstadt, G. PETER LEPAGE, Cornell University — Effective field theories have often been applied to systems with inelastic reactions that produce particles with large momenta outside the domain of validity of the effective theory. The effects of the deeply inelastic reactions have been taken into account in previous work by adding local anti-Hermitian terms to the effective Hamiltonian density. We show that an additional modification is required in equations governing the density matrix when multi-particle states are considered. We define an effective density matrix by tracing out states containing high-momentum particles, and show that it satisfies a Lindblad equation, with Lindblad operators determined by the anti-Hermitian terms in the effective Hamiltonian density.

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