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Time-dependent Green's Functions Approach to Nuclear Reactions[1] ARNAU RIOS HUGUET, NSCL and Physics & Astronomy Department, Michigan State University, East Lansing (MI), PAWEL DANIELEWICZ, BRENT BARKER, NSCL and Physics & Astronomy Dept., Michigan State University, East Lansing (MI) — Nonequilibrium Green's functions represent underutilized means of studying the time evolution of quantum many-body systems. The Kadanoff-Baym equations describe the time evolution of quantum systems including memory effects and correlations beyond the mean field [1]. In nuclear physics, these have been solved for homogeneous matter [2,3], but few is known about the effects that correlations induce in a dynamical description of finite nuclei. This is particularly relevant for the case of central low-energy reactions (fusion, fission), where dissipative effects come into play [4]. We discuss the mean-field evolution for the density matrix of colliding slabs in 1D [5] and describe the extension of the dynamics to the correlated case in the Born approximation.
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