

Multi-Nucleon Transfer Reactions and the Creation and the Evolution of the Compound Nucleus

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概 要

We present the first implementation of a novel extension of the Generator Coordinate Method (GCM), dubbed the enhanced GCM (eGCM), which is applied to the grazing Multi-Nucleon Transfer (MNT) reaction $48\text{Ca}+208\text{Pb}$ near the Coulomb barrier. eGCM incorporates major qualitative differences with either Time-Dependent Hartree-Fock (TDHF) or GCM frameworks used until now for nuclear reactions. We demonstrate that the eGCM framework describes for the first time in a fully quantum microscopic framework the emergence and the time-evolution of Niels Bohr's 1936 conjectured Compound Nucleus (CN). The thermalization time extracted in eGCM is at least two orders of magnitude larger than the Eigenstate Thermalization Hypothesis (ETH) would predict.

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