



Breakup dynamics in the projectile zero binding limit

Bahati Mukeru

Department of Physics, University of South Africa, P. O. Box 392, Pretoria 003,
South Africa

We study the breakup dynamics of proton-and neutron-rich systems in the zero binding energy limit. The main motivation is to investigate whether finite breakup observables can be obtained in this limit where an s-wave neutron-rich system can be regarded as an open quantum system. It is first shown that for an s-wave neutron-rich system, the ground-state wave function extends to infinity and it is no longer square-integrable. Despite this, finite breakup cross sections are still obtained, whereas the elastic scattering cross section fails to converge. For proton-rich and non-s-wave neutron-rich systems, the Coulomb and centrifugal barriers in the ground-state prevent the extension of the ground-state wave function to infinity as the binding energy approaches zero. In this case, converged elastic scattering cross sections is obtained.

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