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Influence of Resonances on Breakup Dynamics in 6,7Li + 209Bi Systems

The study of exotic nuclei, particularly those that are weakly bound, continues to attract significant interest due to their unique structural and reaction properties. In this work, we investigate the influence of resonant states on the breakup process and its interplay with other reaction channels such as elastic scattering and fusion cross sections. Specifically, we examine the 6Li and 7Li systems on a heavy target nucleus 209Bi, at energies above the Coulomb barrier. The theoretical framework employed is the Continuum Discretized Coupled Channels (CDCC) method, which accounts for the coupling between bound and continuum states of the projectile. Our results highlight the significant role of resonances in enhancing breakup, elastic scattering angular distributions, and suppressing complete fusion through increased flux loss to nonelastic channels. These findings provide further insight into the reaction dynamics of weakly bound systems and the impact of cluster resonances on nuclear reaction observables.

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