

Influence of projectile breakup on complete fusion

A. Mukherjee

Saha Institute of Nuclear Physics, 1/AF, Bidhan Nagar, Kolkata-700064, INDIA

e-mail: anjali.mukherjee@saha.ac.in

A subject of current interest in the field of heavy ion reaction mechanisms at near barrier energies is the investigation of the role of the breakup process of weakly bound nuclei on the fusion mechanism. This has primarily been motivated by the present availability of radioactive ion beams at many laboratories around the world. Understanding the reaction mechanisms of loosely bound projectiles and the coupling of their breakup on various channels is very significant for the understanding of reactions of astrophysical interest and for the production of new nuclei near the drip lines.

Studies with unstable projectiles are still limited, owing to the low intensities of the radioactive ion beams presently available. Instead, studies with weakly bound stable projectiles, for which high intensity beams are readily available, can serve to be an important step towards the understanding of the influence of breakup on the fusion mechanism. Indeed in the last few years, special attention has been paid towards fusion studies at near barrier energies, using the weakly bound stable projectiles.

In order to have a detailed understanding of the subject, it is very essential to have a systematic study of various systems in different mass regions. The talk will highlight the present status of the reactions carried out using weakly bound stable projectiles with targets in different mass regions. However, special emphasis will be given to the reactions ${}^{6,7}\text{Li}+{}^{159}\text{Tb}$, ${}^{10,11}\text{B}+{}^{159}\text{Tb}$ and ${}^{10,11}\text{B}+{}^{209}\text{Bi}$.