

Probing exotic structures with electromagnetic dissociation: Applications in Nuclear Astrophysics

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Coulomb breakup of nuclei, away from the valley of stability, has been one of the most successful probes to unravel their structure. However, it is only recently that one is venturing into medium mass nuclei like ^{23}O , ^{31}Ne and ^{37}Mg . This is an exciting development which has expanded the field of light exotic nuclei to the deformed medium mass region. In this talk, we shall show how to incorporate the deformation effects of the projectile in the fully quantal theory of Coulomb breakup formulated under the aegis of the fi-
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nite range distorted wave Born approximation. We shall identify reaction observables, which are 'prone' to deformation effects of the projectile by studying the breakup of medium mass exotic nuclei in the field of a heavy target and compare our results with the available data. New results on the breakup of ^{34}Na and ^{37}Mg - possible halo candidates - will also be presented. We shall show new applications of our work in nuclear astrophysics by presenting results on radiative capture reactions involving deformed nuclei.