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Coulomb breakup of 31Ne within the finite range DWBA

Coulomb breakup of nuclei away from the valley of stability have 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 23O and 31Ne. This is a very new and exciting development which has expanded the field of light exotic nuclei to the deformed medium mass region.
In this contribution we report an extension of the previously proposed [1, 2] theory of Coulomb breakup within the post-form finite range distorted wave Born approximation to include deformation of the projectile. The electromagnetic interaction between the fragments and the target nucleus is included to all orders and the breakup contributions from the entire non-resonant continuum corresponding to all the multipoles and the relative orbital angular momenta between the fragments are taken into account. Only the full ground state wave function of the deformation projectile, of any orbital angular momentum configuration, enters in this theory as input, thereby making it is free from the uncertainties associated with the multipole strength distributions that may exist in many of the other theories.

We shall present the one neutron removal cross section and other reaction observables in the Coulomb breakup of 31Ne on heavy targets at 234 MeV/nucleon beam energy and we will also compare our results with the recent experimental data [3]. The effect of deformation on various reaction observables will be studied.

References

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