Contribution ID: **250** Type: **Oral Contribution**

Core-valence absorption in breakup and stripping reactions and itsisospin dependence

Wednesday 26 October 2022 17:30 (25 minutes)

Nucleon removal reactions at intermediate energies have proven of great value to extractspectroscopic information from exotic atomic nuclei. For the case of nucleon removal at inter-mediate energies, a trend was noticed in the early 2000s in which cross sections were found tobe significantly overestimated for the removal of deeply-bound nucleons in asymmetric nuclei,while the removal of the weakly-bound species in these same nuclei did not present such anoverestimation [1]. The fact that this trend has not been observedin transfer or knockoutreactions with proton targets (p, pN) urges for the reevaluation of the description for thesereactions [2].
After nucleon removal, removed nucleon and residual nucleus (thecore) are left in a stateof medium or high relative energy, and their interaction can lead to the destruction of the core,which results in a reduction of the cross section. This effect would naturally be more intensein the removal of more deeply-bound nucleons, which interact morestrongly with the core, buthas not been considered in standard calculations of nucleon removal reactions until now.
In order to assess the importance of this effect, in this contribution we extend the usualdescription of breakup reactions (where both removed nucleon and core are detected) via Continuum-Discretized Coupled-Channels (CDCC) [3] to include the absorption between nu-cleon and core through an expansion in the eigenstates of a complexpotential which describesthis absorption, correcting for their non-orthogonality throughthe use of a biorhogonal basis[4], applying these results to neutron breakup of ^{11}Be and ^{41} Ca on ^{12}C targets at energies of 70MeV/A.
We also present some preliminary results for stripping reactions (where the removed nucleonis absorbed and only the core is detected), where absorption is modelled via an effective den-sity, focusing on the modification of the "quenching factors"and their dependence on isospinasymmetry, where we find a significant reduction in this dependence.
[1] A. Gadeet al, Phys. Rev. C77, 044306 (2008)
[2] T. Aumannet al, Prog. Part. Nucl. Phys.118, 103847 (2021)
[3] N. Austernet al, Phys. Rep.154, 125 (1987)
[4] B. H. McKellar and C. M. McKay, Aust. Jour. Phys.36, 607 (1983)

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Session Classification: P2 Nuclear Structure, Spectroscopy, and Dynamics

Track Classification: P2 Nuclear Structure, Spectroscopy, and Dynamics