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Analysis of (p,pN) reactions with light nuclei in inverse kinematics

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The quenching single-particle strength and its proton-neutron asymmetry dependence is an interesting topic in the last decade. It is well known that results from transfer reactions and nucleon removal do not agree with each other. Recently, the proton-induced nucleon knockout (p, pN) reactions have been applied to rare isotope beams at intermediate energies in inverse kinematics to study the quenching of spectroscopic factors, also known as the reduction factor. Since the reduction factors strongly depend on the reaction model, it is important to investigate the effect of various corrections and uncertainties of the model in used on the results.

In our study, we have analyzed the $(p, 2p)$ and (p, pn) reactions data measured at the R^3B/LAND setup at GSI for a wide range of carbon, nitrogen and oxygen isotopes in the incident energy range of 300–450 MeV/u. Cross sections and reduction factors are calculated by the standard partial-wave DWIA method. In this talk, I will discuss our recent work on this subject and its implication for the study of quenching single-particle strength.

Field of your work

Theoretical nuclear physics

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