Contribution ID: **1** Type: **not specified**

Excitation of isobaric analog states from (p,n) and (3He,t) charge-exchange reactions within the G-matrix folding method

Wednesday, 18 August 2021 15:30 (15 minutes)

Differential cross sections of (p,n) and (3He,t) charge-exchange reactions leading to the excitation of the isobaric analog state (IAS) of the target nucleus are calculated with the distorted wave Born approximation. The G-matrix double-folding method is employed to determine the nucleus-nucleus optical potential within the framework of the Lane model. G matrices are obtained from a Brueckner-Hartree-Fock calculation using the Argonne Av18 nucleon-nucleon potential. Target densities have been taken from Skyrme-Hartree-Fock calculations which predict values for the neutron skin thickness of heavy nuclei compatible with current existing data. Calculations are compared with experimental data of the reactions (p,n)IAS on 14C at Elab = 135 MeV and 48Ca at Elab = 134 MeV and Elab = 160 MeV, and (3He,t)IAS on 58Ni, 90Zr, and 208Pb at Elab = 420 MeV. Experimental results are well described without the necessity of any rescaling of the strength of the optical potential. A clear improvement in the description of the differential cross sections for the (3He,t)IAS reactions on 58Ni and 90Zr targets is found when the neutron excess density is used to determine the transition densities. Our results show that the density and isospin dependences of the G matrices play a non-negligible role in the description of the experimental data.

Experimental nuclear physics

Theoretical nuclear physics

1

Primary author: PHAN, Nhut Huan (Institute of Fundamental and Applied Sciences, Duy Tan University)

Presenter: PHAN, Nhut Huan (Institute of Fundamental and Applied Sciences, Duy Tan University)

Session Classification: Young Scientist Session 3