



Contribution ID: 32

Type: **Presentation**

Determination of asymptotic normalization coefficients of mirror states in ^{25}P from the $^{24}\text{Ne}(d,p)^{25}\text{Ne}$ reaction.

Wednesday, 2 July 2014 09:50 (25 minutes)

The structure of nuclei at and beyond the proton-drip line is very interesting as they show very attractive features such as halo structures, mirror symmetry breaking and narrow resonances in the continuum. In addition, they are important in the understanding of the rapid proton capture nucleosynthetic process (rp process). Knowledge of the nuclear properties in the light proton drip line region are key inputs to network calculations of the rp-path. However, little spectroscopic information is known about the structure of ^{25}P which is proton unbound. Up to now only an upper limit of the lifetime of the unbound ground state has been measured [1].

Here we present the asymptotic normalization coefficients (ANCs) for mirror states in ^{25}P obtained from the neutron transfer reaction $^{24}\text{Ne}(d,p)^{25}\text{Ne}$ at 10.6 AMeV [2] and using proton resonance energies obtained from a two-body potential approach. Preliminary results from the analysis shows that the neutron stripping to the states of ^{25}Ne is rather peripheral enabling the prediction of proton widths in ^{25}P using the mirror symmetry.

[1] <http://www.nndc.bnl.gov>; G. Audi et al, Nucl. Phys. A 729, 337 (2003).

[2] W.N. Catford et al. Phys. Rev. Lett. 104 19 (2010).

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Session Classification: Session 5

Track Classification: Prefer Presentation