Probing ^{6}He structure from proton inelastic collisions

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Inelastic scattering is a useful process to study the excitation modes of Halo nuclei which is expected to single particular multipolar excitations. It is fair to say that our knowledge of the Borromean resonant continuum sea is today very inconclusive and a detailed study of the resonances in the continuum sea is now one of the priority tasks of radioactive beam research.

We shall present a study of elastic and inelastic scattering of ^{6}He at 70 MeV/u [1] using the multiple scattering expansion of the total transition amplitude scattering framework [2].

We assume that ^{6}He is well described by a 3-body cluster of an α core and two valence neutrons. The bound and continuum wave functions are expanded in Hyperspherical Harmonics, for which the radial wave functions are found by solving a a coupled channel Schrödinger problem with effective coupling potentials. We will compare the inelastic scattering observables obtained from wave functions generated by expanding the radial functions in a Gauss-Laguerre and Transformed Harmonic Oscillator (THO) basis.

[1] A.A. Korsheninnikov at al, Nucl. Phys. **A616**, 189c (1997)

[2] R. Crespo and R.C. Johnson, Phys. Rev. C**60**, 034007, (1999); R. Crespo, IJ. Thompson and A.A. Korsheninnikov, Phys. Rev. **C66**, 021002 (2002).

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