Exploring the ^{6}He continuum sea through proton inelastic collisions

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Inelastic scattering at intermediate energies can be a useful tool to study multipole excitations of borromean nuclei (like ^{11}Li and ^{6}He). For such nuclei it is crucial to take into account the few body degrees of freedom.

The Multiple Scattering expansion of the total Transition amplitude (MST) [1] is a convenient scattering framework that has already been applied to analyse such reactions [2]. In particular, it can also take into account spin excitations that occur when scattering from a spin target such as a proton. This scattering method has been applied using Pseudo State scattering wave functions which are adequate if only a description of the interiour of the wave function is required.

We present here a study of inelastic scattering of ^{6}He from protons within the MST sacttering framework assuming ^{6}He to be well described by a core and two valence neutrons. Differential cross sections and energy spectra are shown for p-^{6}He at 700 MeV/u. The role of spin interactions in the excitation will be analysed [3].

We also present in here benchmark calculations of proton inelastic scattering from ^{6}He making use of with different Pseudo state scattering functions to describe the continuum [4,5]. We aim to check simultaneously the adequacy of the structure calculations and the use of such functions to describe the inelastic scattering.

Comparison between the MST and 4-body CDCC scattering framework will be made

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