Service de Physique Nucléaire

Séminaire

le vendredi 14 septembre 2012 à 11h

CEA Saclay, Orme des Merisiers, Bât. 703, Salle 135

Eikonal method for Borromean nuclei

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Breakup reactions have become the most used tool to describe halo nuclei. A reliable description of the breakup process must include an accurate wave function and an appropriate reaction model. For Borromean nuclei, usually described as three-body systems, a description of the continuum states with correct boundary conditions is a challenging task. This has been done by using the R-matrix method but it leads to time consuming calculations. Approximation methods to describe the continuum such the pseudo-states or the complex scaling methods are often employed in the literature. In this work, we assess the validity of the approximation methods by calculating three-body E1 distributions.
Assuming a dipole Coulomb process, the breakup cross sections can be expressed in terms of a dipole strength distribution. This approximation is generally used to describe the breakup process of halo nuclei. In this work, we employ a four-body eikonal model to describe the elastic and breakup process of ^{11}Li on ^{208}Pb at 70 MeV/nucleon. We compare our calculations with the available experimental data and we obtain good agreement. The present model makes it possible to compute independently the E1 distribution and the breakup cross sections. This also allows us to discuss about the derivation of the experimental E1 distributions and to suggest that the simple Coulomb dipole approximation should be replaced by more elaborate methods.

Le café sera servi 10 minutes avant

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