Service de Physique Nucléaire

Séminaire

Vendredi 30 juin 2006 à 11h00
CEA Saclay, DSM/DAPNIA/SPhN
Orme des Merisiers, Bât. 703, Salle 135

Calculation of resonances in ^{6}He with FaCE code

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Loosely bound neutron rich nuclei usually have few bound states and all the other structures lie above the two-body or three-body thresholds. Moreover, nuclei like the He isotopes show an interesting jumping from bound to unbound systems while the number of neutrons is increased. The intermediate unbound systems usually are observed as resonances during scattering experiments. This raises questions about the role played by the two-body resonant subsystems in the overall structure of a stable nucleus and whether they can explain some of the striking properties of halo nuclei. The system investigated here is the benchmark ^{6}He nucleus.

In our approach ^{6}He is modeled as a three-body system given three effective two-body interactions. The three-body wavefunction in hyperspherical coordinates is expanded on a set of Jacobi polynomials for the hyper-angular part and Laguerre polynomials for the hyper-radial part. Within this basis the three-body matrix elements are calculated and diagonalization is performed. In order to isolate three-body resonances from the continuum spectrum, the FaCE (**Fa**deev calculations with **C**ore **E**xcitation) code was extended to complex hyper-radial space applying Complex Scaling technique. Obtained results are discussed and compared to other calculation techniques and experiments.

Le café sera servi 15 minutes avant
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