国立研究開発法人理化学研究所　仁科加速器科学研究センター
第284回 RIBF核物理セミナー
RIKEN Nishina Center for Accelerator Based Science
The 284th RIBF Nuclear Physics Seminar

The molecular cluster model for 12C and the description of inelastic processes in 12C induced by alpha particles

Prof. Andrea Vitturi
(INFN Padova, Italy)

The three-alpha algebraic molecular model is used in 12C to construct densities and transition densities connecting low-lying states of the rotovibrational spectrum, first and foremost those belonging to the rotational bands based on the ground and the Hoyle states. These densities are then used as basic ingredients to calculate, besides electromagnetic transition probabilities, nuclear potentials and form factors to be used to describe elastic and inelastic alpha+12C scattering processes. The calculations confirm the role played by nuclear inelastic processes as a basic tool for investigating nuclear structure properties, as complementary to electromagnetic probes. In this respect, our calculations give support to the use of algebraically-based molecular models in the description of cluster-like nuclei.

The calculated densities, transition densities and resulting cross-sections are also compared with those obtained within the Antisymmetrized Molecular Dynamics (AMD) model and, alternatively, with those obtained by directly solving the problem of three interacting alpha's within a three-body approach where continuum effects, relevant in particular for the Hoyle state, are properly taken into account.

Dec. 12th(Thu.)2019　13:30～
RIBF Hall, RIBF bldg., RIKEN

＊The talk will be given in English language.

Contact: Nuclear Physics Seminar Organizing Committee
npsoc@ribf.riken.jp
http://ribf.riken.jp/~seminar/