乞掲示

理化学研究所原子核グループコロキウム　*2001. 11. 16*

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題目 ： The study of properties of unstable nuclei at GSI

∗ The seminar will be given in *English.*

日時 ： 2001年 11月 16日 (Fri.)　10:30 –

場所 ： RIKEN Exhibition Office (RIKEN Gallery) 1F AV Room

Abstract

I would like to talk about our new experimental results of light neutron-rich nuclei in the mass region around A ≈ 20. The secondary beams (≈ 500-600 MeV/nucleon) of unstable nuclei were produced at GSI by fragmentation of $^{4}0$Ar primary beam and selected with the Fragment Separator (FRS). Inelastic scattering of a secondary beam on Pb and C target has been studied and subsequent neutron and γ decay of the projectile were investigated by using the LAND and Crystalball setup.

The γ-decay transitions measurements in Coulomb dissociation gives access to details of the ground state configuration of loosely bound nuclei. We investigated the ^{15,17}C, ^{14}B, ^{11} Be isotopes. The comparison between the experimental Coulomb dissociation cross section with the one calculated in a direct break up model, shows that the main contributioin to the ground state configurations of ^{15,17}C and ^{14}B are ^{14}C$(0^{+})\otimes\ \nu_{s1/2}$, ^{16}C$(2^{+})\otimes\ \nu_{s,d}$ and ^{13}B$(0^{+})\otimes\ \nu_{s,d}$ respectively. Results from systematic measurements of the dipole response of neutron-rich Oxygen isotopes will be discussed as well.

Neutron capture process on neutron rich C, N and O isotopes play an important role in astrophysical scenarios ranging from nucleosynthesis in stellar He and C burning stages to possibly inhomogeneous big bang synthesis model. The measured capture cross sections are limited. I would like to discuss also the estimated capture cross section in this relevant isotopes from inverse Coulomb dissociation cross section. I may also discuss about the comparison between our measured cross section of the fragmentation reaction of the neutron rich nuclei with several theoretical calculations.

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