



独立行政法人理化学研究所 仁科加速器研究センター

第95回RIBF核物理セミナー

RIKEN Nishina Center for Accelerator Based Science

The 95th RIBF Nuclear Physics Seminar

## Halo structure and shell evolution studied by breakup reactions

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Nuclear halo is a weakly-bound exotic state of nuclear matter where one or two valence nucleons extend far beyond the classically forbidden range. It is interesting to note that structures of some halo nuclei may show the change of shell structure from the conventional one. In this seminar, we present the recent experimental results on halo nuclei, using the Coulomb and nuclear breakup. In the first part, we present results from nuclear breakup reactions of a Borromean halo nucleus  $^{14}\text{Be}$  on proton at about 70MeV/u measured at RIPS at RIKEN, and discuss the intermediate state of  $^{13}\text{Be}$ . We have found the low-lying intruder state of  $^{13}\text{Be}$ . In the second part, we present the recent results on inclusive breakup reactions of  $^{22}\text{C}$  and  $^{31}\text{Ne}$  using the newly commissioned RIBF. These nuclei have been candidates of halo nuclei, located heavier than the known halo nuclei. Enhanced Coulomb breakup cross sections have indeed been observed, which gives evidence that  $^{22}\text{C}$  is a two-neutron halo nucleus, and  $^{31}\text{Ne}$  is a one-neutron halo nucleus. The structure of  $^{31}\text{Ne}$  is also discussed in terms of island of inversion (shell evolution), as well as deformation towards the drip line. Finally, we discuss the near-future experiment on breakup of halo nuclei at RIBF.

Feb. 23(Tue), 2010 10:00-  
RIBF Conf. Hall, RIKEN

*The seminar will be given in English.*

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