



国立研究開発法人理化学研究所 仁科加速器研究センター  
第265回 RIBF核物理セミナー  
RIKEN Nishina Center for Accelerator Based Science  
The 265th RIBF Nuclear Physics Seminar

Interplay between nuclear shell evolution and shape deformation  
revealed by the magnetic moment of  $^{75}\text{Cu}$

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Exotic nuclei are characterized by a number of neutrons (or protons) in excess relative to stable nuclei. Their shell structure, which represents single-particle motion in a nucleus, may vary due to nuclear force and excess neutrons, in a phenomenon called shell evolution. This effect could be counterbalanced by collective modes causing deformations of the nuclear surface. We studied the interplay between shell evolution and shape deformation by focusing on the magnetic moment of an isomeric state of the neutron-rich nucleus  $^{75}\text{Cu}$ , where low-lying states of the Cu isotopes exhibit an intriguing behavior involving the shell evolution. The magnetic moment measurement was carried out at the BigRIPS at RIBF. The spin alignment as large as 30% was achieved in the isomeric state of  $^{75}\text{Cu}$  by a scheme of two-step projectile fragmentation scheme with a technique of momentum-dispersion matching [1], incorporating an angular-momentum selecting proton removal from  $^{76}\text{Zn}$ . The high spin alignment made it possible to determine the magnetic moment of the isomeric state of  $^{75}\text{Cu}$  for the first time. In this seminar, introduction of the production of the spin-aligned beam, experimental results and discussion based on the magnetic moment will be presented.

[1] Y. Ichikawa et al., Nature Phys. 8, 918-922 (2012)

Paper: Y. Ichikawa et al., Nature Physics, published online on 21 January, 2019 (DOI: 10.1038/s41567-018-0410-7)

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RIBF Hall, RIBF bldg., RIKEN

\* The talk will be given in English language.

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