独立行政法人理化学研究所　仁科加速器研究センター
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The 184th RIBF Nuclear Physics Seminar

Measurement of the hyperfine structure constant for laser-cooled Be-11 ions

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The hyperfine splittings of the atomic ground state of singly ionized Be-11 have been measured via laser-microwave double resonance spectroscopy for trapped and laser-cooled Be-11 ions. The ions were produced from the projectile fragmentation reaction at relativistic energies at the RIKEN projectile fragment separator RIPS and subsequently slowed down and trapped at mK temperatures in an online trap setup which includes the prototype SLOWRI. From the measurements of the transition between the magnetic sublevels of mF=0 under different magnetic fields the frequencies of which are independent of magnetic fields to the first order, the magnetic hyperfine structure constant of the singly charged Be-11 ion was determined with an relative precision of 0.03 ppm. This measurement provides an essential data for the study of the distribution of the halo neutron in the single neutron halo nucleus Be-11 through the Bohr-Weisskopf effect. In this seminar, I will present the experimental procedure and discuss its result.

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RIBF Hall (rm.201), RIBF bldg., RIKEN

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