

## RIKEN RI Beam Factory Project - present status and perspectives -

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I discuss experimental programs for studies of nuclear reaction and structure by using radioactive isotope beams available at “RI beam factory (RIBF)” in RIKEN through introducing recent highlights and illustrating present and coming devices.

RIBF is the world-class radioactive-isotope beam (RIB) facility, which is based on a new high-power heavy-ion accelerator complex [1] and a new in-flight fragment separator BigRIPS [2]. In 2007, RIBF started to deliver radioactive isotope beams. High performances and potentialities of this facility have been demonstrated by discovery of two new isotopes [3].

The accelerator system has been upgraded since 2007. Additional beam monitors have been installed to strengthen a beam diagnostic and to improve a transmission-efficiency. Last year maximum intensities achieved for  $^{48}\text{Ca}$  and  $^{238}\text{U}$  beams at 345A MeV were 175pA and 0.3pA, respectively. To have more intense beams of Xe/U, intensive efforts have been made in developing charge strippers as well as a new 28GHz SC-ECRIS. A new injector linac is being constructed to be in operation JFY2010. Combination of the SC-ECRIS and the new linac will make the U beam intensity greater than 50 pA.

Concerning experimental devices, ZeroDegree Spectrometer (ZDS) [4] and SHARQA spectrometer [5] were constructed and commissioned. Based on the powerful  $^{48}\text{Ca}$  beam, a few spectroscopy experiments at BigRIPS/ZDS were performed for the island-of-inversion region as a DayOne experiment campaign in December, 2008.

Other installations, a versatile spectrometer (SAMURAI) [6] and SCRIT system for e+RI scattering [7] have been funded and will be ready for experiments in 2011. An rf ion-guide gas-catcher system SLOWRI [8], Rare-RI Ring dedicated for mass measurement [9], IRC-to-RIPS BT line for multi-use capability [6] are to be funded in near future.

### References

- [1] Y. Yano, contribution to the 21st biennial Particle Accelerator Conference (PAC05), Tennessee, USA, May 2005.
- [2] T. Kubo, Nucl. Instrum. Methods B204 (2003) 97.
- [3] T. Onishi et al., J. Phys. Soc. Japan 77 (2008) 083201.
- [4] H. Sakurai, Nucl. Phys. A 805 (2008) 526c-532c.
- [5] T. Uesaka et al., Nucl. Instrum. Methods B266 (2008) 4218-4222.
- [6] Technical information on experimental installations are found in <http://rarfaxp.riken.go.jp/RIBF-TAC05/>
- [7] M. Wakasugi, et al., Phys. Rev. Lett. 100 (2008) 164801.
- [8] M. Wada et al., Hyperfine Interactions 173 (2006) 153-163
- [9] Y. Yamaguchi et al., Nucl. Instrum. Methods B266 (2008) 4575-4578