

Dear RIBF users

This is the 6th issue of the RIBF Quarterly with the most up to the minutes information on our RI Beam Factory.

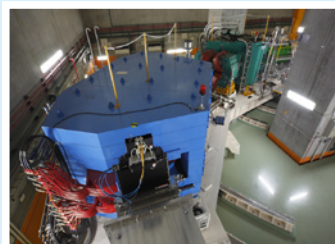
The past issues are available at our web site : <http://www.nishina.riken.jp/UsersGuide/>

SHARAQ Launched !

The SHARAQ spectrometer and dispersion-matching beam line have been successfully commissioned. The spectrometer has been constructed by Univ. of Tokyo, and the beam line by Nishina Center.

The primary purpose of this spectrometer is spectroscopic studies of nuclei via new exothermic reactions induced by RI beams.

On March 23, 2009 the first beam of ^{14}N at 250A MeV was successfully transported to



SHARAQ. In the second commissioning run in May 2009, lateral and angular dispersion matching conditions have



been realized simultaneously. The overall momentum resolution was found to be 1/8000.

On June 30, a ceremony was held to celebrate the completion of SHARAQ and the success of the commissioning runs. Among the invited to the ceremony were Prof. Arima, two vice presidents of University of Tokyo, and a governor of RIKEN.

SHARAQ home page : <http://www.cns.s.u-tokyo.ac.jp/sharaq/>

Present status, operation schedules of RIBF

Superconducting ECR ion source

The Superconducting ECR is now on site, and is being commissioned. A new beam line connecting to the RILAC has been completed, and the first beam test for this new system will be done in July. U beam with the intensity of 10 times higher is expected, which will be provided to a series of BigRIPS experiments scheduled in November. In order to provide a stable supply of intense U beam for users, development of charge strippers for intense U beam is continuously ongoing.

RILACII installation

The fabrication of RILACII is going on as scheduled. Its commissioning will take place in the next fiscal year. The installation and related construction at the AVF hall is scheduled from the middle of this December till the end of March 2010, which prohibits any experiments using AVF during this period.

After its completion, we will be able to perform BigRIPS experiments and long-term Super Heavy Element Search experiments simultaneously.

BigRIPS related construction

The installation of the "pillow seal" having a remotely releasable mechanism, which facilitates maintenance under high residual radiation, will be done this summer as scheduled. Construction of additional shielding in these areas will proceed to reduce heat loads and radiation damages of the superconducting quadrupole magnets placed downstream of the target chamber and the beam dump. We will be ready to accept intense primary beam by the end of September.

Shielding walls between the ZeroDegree spectrometer and the SAMURAI spectrometer will be partly installed this summer, in order to make it possible to construct the SAMURAI spectrometer independently of beam time scheduling. The walls are expected to be completed in January 2010.

Installation of electron storage ring

The construction of an electron scattering facility for exotic nuclei in the RIBF building is underway as scheduled. Construction of shielding walls for a microtron injector and an ISOL facility is almost completed. The electron ring installation

will start from September, and its operation will the end of this fiscal year.

BigRIPS experiments performed in the last spring

The followings are brief reports on a series of BigRIPS experiments performed in the period from mid-April to mid-May. A new acceleration scheme, AVF+RRC+SRC skipping IRC, was first examined.

1) Acceleration of polarized deuteron (NP0702-RIBF23 K. Sekiguchi)

The 500 MeV polarized deuteron has been successfully accelerated and extracted from SRC. Its polarization was confirmed to be 80 % of the theoretical maximum value. A complete set of deuteron analyzing power for d+p scattering were determined. Related web page is now available at:
http://ribf.riken.jp/~kimiko/RIKEN_Polarized_Deuteron_Beam/

2) Towards spectroscopy of pionic atom via (d, ^3He) reaction (RIBF27 K. Itahashi)

The first experiment has been performed to achieve dispersion matching of the beam line from the SRC exit to the target, and that of the BigRIPS. Using 250A MeV ^{14}N beam, very good achromaticity < 0.1 cm/% at the focus F5 was achieved while keeping large dispersion of 4.5 cm/% at the target position (F0). A preliminary analysis shows the achieved resolving power to be about 3000.

3) SHARAQ commissioning (T. Uesaka)

==> see the top news

4) KAPPA commissioning (T. Kobayashi)

Kappa spectrometer has been commissioned using 250A MeV ^{14}N primary beam. The spectrometer consists of a C-Type magnet, 4 tracking detectors, and hodoscope. Rigidity resolution of about 0.5% (rms) at 1.5 GeV/c was achieved at 1100A excitation. The Kappa spectrometer is now ready to perform PAC-approved (p,2p) and (p,pn) experiments.

Operation Schedule of the second half of this fiscal year

A tentative operation plan for the period from October 2009 to the end of March 2010, is as follows:

BigRIPS experiments

Cooling down of all superconducting magnets of SRC and BigRIPS will start in mid-September. From mid-October, a series of BigRIPS experiments will be conducted for nearly two months. Acceleration test of Xe beam up to SRC comes first, then a SHARAQ experiment follows. From mid-November, a series of BigRIPS/ZeroDegree experiments will be scheduled to run using the primary beams of U and ^{48}Ca .

The other experiments

As described in "RILACII installation", a long-period construction is planned for the AVF hall starting from mid-December to the end of March. Therefore, experiments with the AVF-standalone operation and AVF+RRC will be allocated only for the period from October to mid-December. From mid-December to the end of March, experiments using RILAC stand-alone and RILAC + RRC will be allocated. Commissioning of the newly installed GARIS II will be performed during this period.

Announcement

Beam time requestes

The beam time requests for the latter half of this fiscal year, from October to March 2010, is being called for to all the spokesperson of the PAC approved experiments. The submission deadline of the request is July 27.

PAC

The 5th NP PAC was held in June 18 and 19. About half of the members have been newly nominated. A list of new PAC members are available in the following web page: (<http://www.nishina.riken.jp/UsersGuide/NP-PAC/>).

The 6th NP PAC will be held in the coming December.

The 5th Material and Life Science (ML) PAC will be held in Sep. 3-4. Proposals to be reviewed in this PAC is being called for. The submission deadline is July 31. For further details, please refer the following web pages.

RAL:http://riken.nd.rl.ac.uk/ral/ral_proposal.html
RIBF:<http://www.nishina.riken.jp/UsersGuide/ML-PAC/>

Nishina Center
<http://www.nishina.riken.jp/>

PAC related
<http://www.nishina.riken.jp/UsersGuide/>

RIBF User Group
http://ribfwww.riken.go.jp/exp/RIBF_uec_eng/

Beam Time Schedule
<http://www.nishina.riken.jp/rarfmt/pc.html>

Seminar information
<http://rarfaxp.riken.jp/~seminar>

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User Group Activities

UEC election

The election of new UEC members will be held in September. According to the RIBF Users Group Charter, two experimentalists and one theorist will be newly elected, whose term of office will be

three years. The announcements will soon be sent from UEC.

As for the current UEC members, please refer to the following web page,

http://ribfwww.riken.jp/exp/RIBF_uec_eng/UECmember/UECmember.html

Topics from recent publications

Discovery of large deformation in ^{62}Cr (N. Aoi et al.)

PRL **102**, 012502 (2009).

The structure of ^{60}Cr and ^{62}Cr has been studied by proton inelastic scattering at RIPS. The extracted deformation lengths show evidence for enhanced collectivity in these very neutron-rich nuclei. Observed rapid increase in the energy ratio of the 4^+ state to the 2^+ state indicates the development of large deformation in ^{62}Cr .

the "Island of Inversion" extends to $N=22$ for the Ne isotopic chain.

This is the first secondary-reaction experiment using the world's strongest RI beams produced from intense primary beam of ^{48}Ca , which is a real proof of the start of full-scale operation of RIBF. In the recognition of the above achievement, the press conference was held at MEXT (Ministry of education, Culture, sports, science and technology) on July 15.

^{32}Ne is located inside the Island of Inversion (P. Doornenbal et al.)

PRL **103**, 032501 (2009).

The first spectroscopic study of the $N=22$ nucleus ^{32}Ne have been successfully performed using BigRIPS and ZeroDegree. The excitation energy of the first 2^+ state was determined to be 722 keV, and this low excitation energy shows that

Confirmation of great-grand-daughter of $^{278}113$; ^{266}Bh (K. Morita et al.)

J. Phys. Soc. JPN **78** (2009) 064201.

The results of ^{266}Bh production experiments performed from last Dec. to February throughout the New Year holidays have been published, which strongly support our discovery of the $Z=113$ element.