

Minutes of the 64th Machine-Time Committee Meeting

Date and time: March 15, 2013; 13:30–14:40

Place: RIBF Bldg., Room 203

Attendees: Sakai^a(Chair), Fukunishi^a, Haba^{a,†}, Hirayama^{c,†}(in lieu of Miyatake), Kamigaito^a, Kase^a, Kubo^a, Motobayashi^{a,†}, Nishimura^{a,†}, Shimoura^b, Ueno^a, Uesaka^a, Uwamino^a, Wakasugi^a, Yako^{d,†}(in lieu of Aoi), Yamaguchi^b, Yoshida^{a,†}, Kuboki^{a,†}, Morimoto^{a,†}, Yoneda^{a,†},

Absent: Aoi^{d,†}, Abe^a, En'yo^{a,†}, Miyatake^{c,†}, Morita^a, Sakurai^a

^aRNC / ^bCNS / ^cKEK / ^dRIBF-UEC / [†]Observer
(in random order)

Reports

1. Change of the beam-time schedule (Ueno)

The beam time (BT) of ML1209-LINAC05-01 (Düllmann) was extended for 3 hours due to the delay of the beam delivery.

2. Report on Machine Studies (Kuboki)

- MS-EXP12-11

The in-house BT in the machine study (MS) category was conducted using a ²³⁸U beam delivered from RILAC at $E/A = 0.98$ MeV from 9:00, February 12 to 9:00, February 13. The purpose of the study was to measure the charge-state distribution of ²³⁸U emerging from the H₂ gas charge stripping system. The experimental data are necessary for the design study of a superconducting LINAC for the future upgrade. Although the measurement was performed at the FC-J33 site downstream of RILAC, ²³⁸U ions at the charge state $q = 40^+$, i.e., the charge state of interest, were not identified in the magnetic analysis. Possible reasons include a high background (BG) gas pressure, $P \sim 3.0$ Pa (without H₂), of the current system. Under such high BG pressure, ²³⁸U ions are capable of capturing electrons. The system will be improved so that the gas cell can be vacuumed separately from the other parts to realize a low BG pressure. The measurement will be conducted again following the improvement.

- MS-EXP12-07

The in-house BT in the MS category was conducted using a ⁸⁶Kr beam delivered from RILAC at $E/A = 2.7$ MeV from 9:00 February 14 to 9:00, February 15 where charge-state distributions of a ⁸⁶Kr ion beam emerging from H₂ and He gases were measured. A fraction of 30% obtained with H₂ gas for the charge state $q = 26^+$, which is suitable for the acceleration at RIBF, was found to be comparable with 35% obtained with carbon foils. This observation suggests that the charge stripping system employing a H₂ gas is an important candidate applicable to ⁸⁶Kr beams as a replacement of carbon-foil strippers. In the next measurement with a He gas, the most probable charge state was identified at $q = 23^+$ and 24^+ , whose fractions were commonly 23%. These two charge states are suitable for the ⁷⁸Kr beam acceleration, taking into account the difference in the magnetic rigidity between ⁸⁶Kr and ⁷⁸Kr. It was noted that a suitable gas (H₂ or He) and its density should be carefully determined considering the charge state distribution and the beam emittance growth in order to

utilize the gas stripping system in the ^{78}Kr beam delivery

3. Utility and CGS power in FY2013 (Kase)

Based on the outline of the BT in FY2013 tentatively scheduled by the MT Committee, the electric power plan of the Wako Campus in FY2013 was discussed between a relevant department and RNC. Although a decrease in the contract maximum demand was initially considered, taking into account the extra 3 MW power available at most with the two gas turbine engine generators newly installed at the Wako Campus, the maximum demand will remain the same level as in FY2012 due to various factors. With regard to the gas contract for the Co-Generation System (CGS) operation, it was explained that the amount of gas consumption during winter time affects not only the gas rate for the relevant fiscal year but also that for the next fiscal year. The above-mentioned RIBF BT outline was planned so as to minimize the difference in the monthly gas consumption in winter time resulting in a low cost of the gas rate.

4. Maintenance of CGS & Accelerators (Kase)

- CGS

In addition to the regular inspection and maintenance conducted for every 4,000 hours of operation, the full scale maintenance should be conducted for the CGS for every 24,000 hours of operation (approximately once every 3 years). The 24,000-hour maintenance was conducted this year from the end of January to March where the CGS gas turbine and other parts were temporarily removed and transported to factories as follows.

- Gas turbine maintenance (Jan. 29–Mar. 9)
- Reducer maintenance (Jan. 30–Mar. 8)
- Generator maintenance (Feb. 20–Mar. 3)

All these parts have already been brought back to RIBF after the maintenance. On-site final adjustments are in progress to prepare for the upcoming full-scale RIBF operation scheduled from April.

- Absorption refrigerators

In the CGS, the absorption refrigerators produce cooling water for the accelerator devices and the air conditioners by utilizing exhaust heat from a gas turbine. Although there are five 400-refrigerating-ton (RT) refrigerators and three 360-RT refrigerators in the RIBF, one of the refrigerators has been malfunctioning for a long time. Its repair has been progress at a factory from January 20 to March 19.

- RRC

The Accelerator Group checked the RRC resonator, MDC1, and MDC2 (magnetic deflector channel) from January 20 to March 19. Preparations for the replacement of the RRC main coil tentatively scheduled for the summer were also conducted. The MDC1 and MDC2, placed downstream the EDC (electrostatic deflector channel), were damaged in the ^{238}U beam series in fall 2012. They were not fused but deformed by heat due to the beam irradiation. The baffles were replaced.

- AVF

A vacuum leakage occurred at a vacuum valve and a ceramic part of the resonator connected to the current feed through of the trim coil. The leakage problem was fixed after being replaced. Furthermore, an O-ring of the AVF cyclotron was replaced since it was hardened by heat.

5. Management of new isotope data obtained with BigRIPS (Sakai)

It was proposed at the 61st Meeting to revise the guideline for the operation of BigRIPS experiments. Under the new guideline, a part of the data concerning the findings of new isotopes obtained by experimenters will be analyzed and published as soon as possible by those at RNC who has expertise in the field (i.e., the BigRIPS Team in most cases) either independently or jointly with the experimental group, according to an agreement among the experiment spokesperson, the BigRIPS Team, and the ULIC group director. Further discussions will be conducted by the WG set at the 61st Meeting. A tripartite meeting was held in parallel on Feb. 20 among the spokespersons, the BigRIPS Team, and the ULIC group director, where it was determined to tentatively apply the new guideline to the following two experiments:

- RIBF60&62 (Watanabe, Lorusso)
- RIBF85 (Simpson, Jungclaus, Gadea)

6. Information transmission on the RIBF facility use, etc. (Ueno)

It was reported that the RIBF User Liaison Team responded as follows to the requests presented at the 62nd Meeting.

- The procedure to obtain and conduct beam time at RIBF on the RIBF website (i.e., PAC meetings, BT scheduling requests, etc.) was modified to indicate a standard regular schedule of each step.
- A notification is now being sent via email from the User Liaison Team to inform when the minutes of the MT Committee Meetings will be posted on the RIBF website.
- To improve the provision of the RIBF facility information, SAMURAI and SHARAQ websites have been newly added to the RIBF website by the persons involved.

7. Status of PAC meetings (Ueno)

- 12th NP-PAC (June 28–29): The call-for-proposals will be opened today, March 15, after the tentative two-year primary beam plan discussed below, is announced..
- 10th ML-PAC and 4th In-PAC: Nothing in particular.

Topics discussed

1. Approval of the minutes of the previous meeting (Sakai)

2. Tentative two-year primary beam plan for BigRIPS-based experiments (Sakai)

Discussions on the tentative two-year primary beam plan continuing from the previous meeting ensued. Taking into account details on the backlog of the PAC-approved experiments, the following plan was determined.

- Spring 2013 : ^{238}U , ^{124}Xe , Light ions
- Fall–Winter 2013 : ^{238}U , ^{48}Ca , ^{78}Kr , Light ions

- Spring 2014 : ^{238}U , ^{70}Zn , Light ions (^{78}Kr , ^{48}Ca)
- Fall–Winter 2014 : (open)

3. Outline of the BT schedule for the FY2013 second half (Sakai)

The latest outline of the BT schedule for the second half of FY2013 currently under consideration was presented by the User Liaison Team (Ueno). The outline will be discussed furthermore until the start of BT scheduling for the second half of July.

4. Next meetings

- The next meeting will be held on Friday, April 19, 2013, at 13:30.
- The meeting after the next will be held on Friday, May 24, 2013, at 13:30.