Minutes of the 95th Machine-Time Committee Meeting

Date and time: January 19, 2016; 15:00–17:10

Place: RIBF Bldg., Room 203

Attendees: Sakai[a](Chair), En'yo[a,†], Abe[a], Fukunishi[a], Kamigaito[a], Kubo[a], Morimoto[a], Okuno[a], Sakurai[a], Ueno[a], Uesaka[a], Wakasugi[a], Yamaguchi[b], Imai[d,†], Haba[a,†],Motobayashi[a,†], K. Yoshida[a,†], Otsu[a,†], Tanaka[a,†], A. Yoshida[a,†], Hirayama[c] (in lieu of Miyatake), Kidera[a,†], Ahn[a,†], Sumikama[a,†], Sato[a,†], Isobe[a,†], Y.Yamaguchi[a,†], Shiomitsu[a,†], Okuizumi[a,†],Yoneda[a]

Absent: Kase[a], Miyatake[c], Shimoura[b], Uwamino[a], Morita[a,†], Kishimoto[a,†]

[a]RNC / [b]CNS / [c]KEK / [d]RIBF-UEC / [†]Observer

(in random order)

Reports

1. **Current Status of the Machine Time Operation** (Yoneda)

   The current status of the machine time operation was reported. Since the last MT committee meeting, experiments have been conducted in the old facility only. The experiment ML1501-LINAC20-02(Haba, ^{23}Na@6MeV/u, GARIS) was extended by two hours to compensate for the interrupted beam time due to a RILAC trouble.

2. **Report on the Ion Source** (Kidera)

   The current status of the ^{48}Ca ion source was reported. The ^{48}Ca consumption rate for the MT from Nov. 13, 2015 was 0.39mg/h, which was far greater than 0.13mg/h in 2014 due larger beam current required. Hereafter, about 3 weeks will be the limit set for ^{48}Ca large current supply . The amount of ion source materials currently available are 1.1g (purity 80%) and 970mg (purity 70%). While they will not be exhausted anytime soon, it the timing of the next purchase of the materials should be considered.

3. **Report on Accelerator Machine Study** (Okuno)

   A report was made concerning the accelerator machine study. The alpha-particle acceleration with RILAC2 and RRC was tested, in order to open a possibility of a new RI production. The energy was 7.3MeV/u, and the intensity was 0.86 pnA with a duty of 0.9%. In the next test, trials will be made to use a mesh buncher and to achieve energy uniformity as good as the case of the other RILAC-injected particles.

4. **Report on BigRIPS Machine Study** (K. Yoshida)

   Reports were made concerning the BigRIPS machine study. The target temperature and beam dump temperature were measured under irradiation of a large-intensity ^{48}Ca beam. As a result of the measurement of the temperature change with beam irradiation up to 460 pnA, the target temperature tends to be higher than the ANSYS simulation. The beam dump temperature with the different heat densities and the amounts of cooling water flow was roughly reproduced by the ANSYS. Even if the 1pnA ^{238}U is realized in the future, the current BigRIPS setup cannot accept the full-intensity beam.

5. **Report on Research Record Preservation** (Yoneda)

A report was made concerning the research record preservation. For most of the experiments conducted from April to December, the research record preservation was appropriately completed. The status report will be made regularly hereafter

6. **Report on ImPACT Experiment Plan** (Sakurai)

A report was made concerning the plan of ImPACT experiments in the next fiscal year. In order to complete measurements with an energy of about 50MeV/u before the OEDO is installed next winter, a two-day experiment with ^{238}U will be performed in spring, and an experiment of about 10 days will be performed in autumn. Both experiments will use BigRIPS+ZDS.

7. **Status of PAC Meetings**（Yoneda）

・ 17th NP-PAC:（12/1 － 3）

The call for proposals will be issued in June, and the deadline of proposal submission will be early in October. The replacement of the proposal after the deadline will not be accepted

・ 12th ML-PAC： to be held on February 16 and 17.

・ 4th In-PAC： held on January 13.

Topics discussed

1. **Approval of Minutes of Previous Meeting** (Sakai)

2. **Application of the detector-development MT**

development of Ti-^{3}H target (Imai)

There was a request of the detector-development MT. There is a plan to make a tritium-doped Ti target. In order to confirm its safety and to establish the way of disposal, a D_2-doped Ti with a thickness of 20μm will be irradiated with a beam, and 1) the cross sections for production of long-life RIs, and 2) the amounts of dissociation of D_2 from the target, will be checked. A ^{20}Ne beam with 250pnA and 8.2MeV/u will be used for 1.5 days.

As a result of review, the MT was approved as requested.

3. **Application of the Accelerator Machine Study**

・Acceleration test of 28MeV alpha beam at RILAC (Kamigaito)

In order to check possibility of new RI production, a test will be made to accelerate alpha particles up to 28MeV at RILAC. In the test in June, the acceleration was attempted up to 6MeV/u. Now the safety permission has been given for 7MeV/u acceleration. 1 day of beam time with 10eμA will be used.

・Acceleration test of alpha beam at RILAC2 (Okuno)

In order to check possibility of new RI production, a test will be made to accelerate alpha particles from RILAC2. A mesh buncher will be newly tested. 1 day of beam time with RILAC+RRC will be used.

・Life-time measurement of new charge stripper foil (Okuno)

The lifetime of the carbon charge stripper foil developed for the ^{238}U acceleration will be measured. A ^{238}U beam will be used for 12 hours. It is desired to schedule this measurement after the sequence of the experiments rather than during the beam tuning.

・Study of plasma stripper (Okuno)

The data for development of charge stripper using plasma will be taken. It is anticipated that higher charges will be achieved compared to the solid stripper used so far, but the data available now is only for 1.4MeV/u ^{238}U. New data will be taken to develop the plasma stripper. The RILAC beam will be used for 1.5 days.

As a result of review, all the machine studies were approved as requested.

4. Application of the BigRIPS Machine Study

・^{39}Na yield measurement (Ahn)

The yield measurement of ^{39}Na from the ^{48}Ca primary beam will be done. The last measurement was done with 425pnA for 9.4 hours, but the statistics was not sufficient to confirm that ^{39}Na was produced or it is out of the drip line. The next measurement will be done for 3 days with 500pnA. An additional 0.5 days will be used for systematic measurements of isotope production nearby.

・BigRIPS large intensity test (Yoshida)

The temperature measurement of the target and beam dump with a large-intensity beam will be continued. 0.5 days of measurements will be made with a 700-800pnA ^{48}Ca beam. Other beams with 10kW beam power can also be used.

・High-Z machine study yield measurement (Sumikama)

The beam development will be continued to separate and identify the secondary beam particles around Z=80. In the tests so far, the separation and identification in the region round the stability were achieved. In the next test, the region of the unstable nuclei will be explored. The neutron-rich region has a difficulty that the mixture of the primary beam component is unavoidable, and so the next target will be the proton-rich region. It will be confirmed if the beam purity can be maintained and if the isomer tagging is possible. A ^{238}U beam will be used for 1 day.

・PPAC high-rate study 3 (Sato)

A machine study to check tolerance of PPACs against high-rate beam will be performed. In the measurement so far, it was confirmed that it is possible to operate stably with a ~1MHz secondary beam, and as the next step the rate dependence of the resolution will be checked by using a mask with a pin hole. 0.5 days of beam will be used. Any beam is acceptable.

As a result of the review, all the machine studies were approved. The appropriate schedule will be discussed later again. A comment was given to the High-Z beam study, that the beam development in the neutron-rich region should be considered, as an approved experiment already exists in this region.

5. Application of SAMURAI-TPC Machine Study (Isobe)

A machine study was requested to check performance of SAMURAI-TPC. In the last machine study, the performance was checked without magnetic field, and was confirmed to be as expected. In the next test, it will be confirmed if the circuits work appropriately under magnetic field, and if the performance is as designed. Two-day measurement is desired with a 20kHz secondary beam.
As a result of review, this machine study was approved, but as the 1-day beam time.

6. **Application of Rare RI Ring Machine Study** (Y.Yamaguchi)

A Rare RI Ring machine study was requested. As a continuation of the last machine study with secondary beams, 1) check of dependence on the beam injection angles, 2) check of influence of the main coil and trim coil on the isochronism and momentum width, 3) establishment of the isochronism tuning method with Schottky, will be done, and mass measurement of isotopes with known masses will be realized. A uranium beam or xenon beam will be used for 3 days.
As a result of review, this machine study was approved as requested.

7. **FY2016 Yearly MT Schedule** (Sakai)

A MT Schedule plan of the next fiscal year was shown by ULIC, and opinions were collected. The spring SRC-BigRIPS experiments will be scheduled from April 1 to June 30, and on the day of the open campus, April 23, SRC-BigRIPS experiments will be stopped and biology experiments will be performed. The largest number of beam time requests are sent for the ^{238}U experiments, and there are also many requests for the ^{18}O experiments. The final decision of the beam time will be made after the budget of the next fiscal year is fixed in late February. There was no particular opinion raised by the committee members.

8. **Next Meetings**

- The next meeting will be held on Tuesday, February 23, 2016, at 3pm.
- The meeting after the next will be held on Friday, March 18, 2016, at 10:30am.
- The meeting after April will be, in principle, held on the 3rd Tuesday, at 3pm. The meeting in April will be held on April 19, at 3pm.