

Beam-time statistics of RIBF experiments

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This report describes the statistics of the beam times (BTs) at the RIBF facility in fiscal year (FY) 2017. The BTs are categorized into the following two groups: high-energy-mode and low-energy-mode BTs. In the former mode, the beams are delivered in the acceleration scheme of AVF, RILAC, or RILAC2 \rightarrow RRC \rightarrow (fRC \rightarrow IRC \rightarrow) SRC, where the accelerators in parentheses can be skipped in cascade acceleration depending on the beam species used. In the latter mode, the acceleration scheme is AVF or RILAC (\rightarrow RRC).

The BTs in the high-energy mode were scheduled from April to July and from October to November 2017, considering the restriction of utility-power use, budgetary constraints, the maintenance schedule of the accelerator system and co-generation system, etc. In the series of experiments performed in spring, the primary beams of ^{70}Zn , ^{238}U , and ^{18}O were provided to users, and the ^{238}U primary beam was provided in autumn. Eleven experiments approved by the RIBF Program Advisory Committees¹⁾ with an approved BT of 64.5 days were conducted. The facility development programs used 4.5 days of BT; these are defined as machine study (MS) experiments. In addition, three nuclear transmutation experiments and two director discretionary experiments were conducted as the Nishina Center mission programs.

The summary of the high-energy-mode BTs in FY2017 is given in Fig. 1 as a bar chart. User time decreased compared to the BT in FY2016; this indicates a relatively longer Nishina Center mission BT. The total length of the MS is almost as short as the length in FY2016. Even though there remain only few newly-introduced facility device requiring beam tests, the opportunities of machine studies should be promoted as an investment for expanding the potential capability and availability of the facility.

The summary of the low-energy mode is shown in Fig. 2. Here, the BTs are classified based on the accelerator operation modes, *i.e.*, AVF standalone, RILAC standalone, and RRC. In FY2017, the total BT length of the low-energy mode reduced compare to that in FY2016 because of the RILAC shutdown started in the middle of June 2017 for accelerator upgrade. The relatively longer RRC time is mainly due to the start of the long runs for superheavy element search in December 2017. It is anticipated that RRC will be mostly used for the superheavy element search experiments until RILAC becomes available again in 2019.

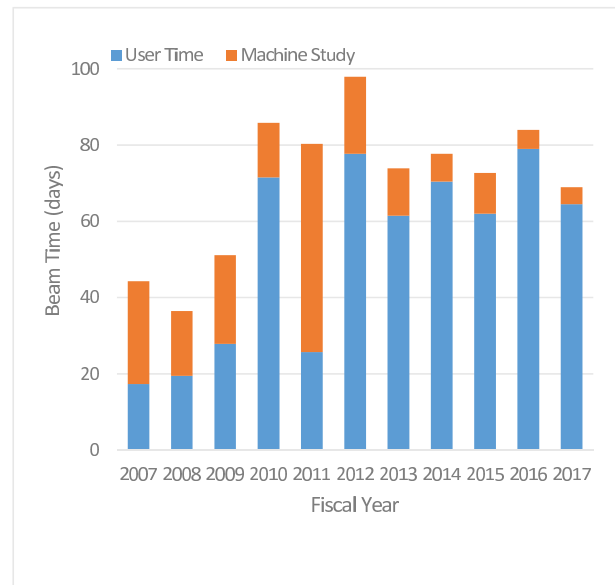


Fig. 1. Bar chart showing the BT statistics for high-energy-mode experiments from FY2007 to FY2017. The accelerator tuning time and Nishina Center mission time are not included.

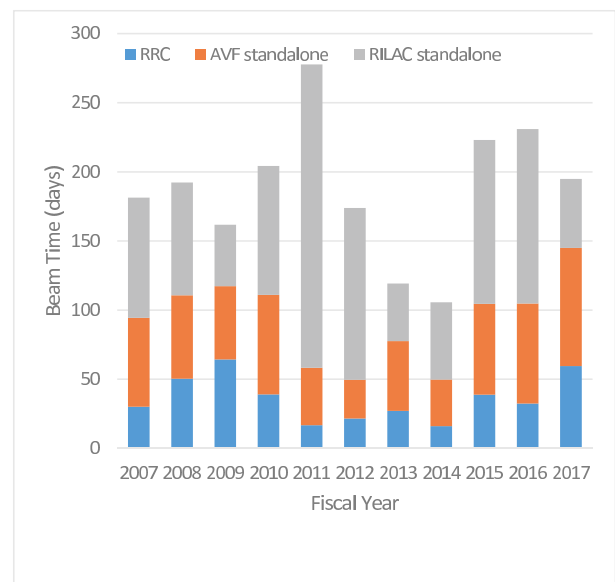


Fig. 2. Bar chart showing the BT statistics for low-energy-mode experiments from FY2007 to FY2017.

References

- 1) K. Yoneda, K. Ishida, H. Yamazaki, N. Imai, Y. Watanabe, K. Yako, H. Miyatake, H. Ueno, H. Sakai, Elsewhere in this report.

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