

## 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) 2013. In the following, the BTs are categorized into two groups: high-energy-mode and low-energy-mode BTs. In the former, beams were 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 the cascade acceleration, depending on the beam species used. In the latter, the acceleration scheme is AVF or RILAC ( $\rightarrow$  RRC).

BTs in the high-energy mode were scheduled in April – July 2013 and in the latter half of March 2014, considering the restriction of utility-power use, budgetary constraints, maintenance schedule of the accelerator system and co-generation system as well as other constraints. In particular, we skipped the October – December period in FY2013, where we regularly assigned high-energy-mode BTs so far. This is mainly due to the rise in electricity costs and lack of operation budget. Big demand of large-scale maintenances, including replacement of the RRC main colis, is also the reason. In the high-energy-mode BTs in FY2013, the primary beams of  $^{18}\text{O}$ ,  $^{124}\text{Xe}$ , and  $^{238}\text{U}$  were delivered to users, for  $T_{BT} = 60.5$  days to conduct 13 experimental programs approved by the RIBF Program Advisory Committees<sup>1)</sup>. Including  $T_{BT} = 14.3$  days used by RIKEN for facility development programs, defined as machine study (MS) experiments,  $T_{BT} = 74.8$  days was used in total for the experiments in the high-energy mode. The data summary of the high-energy-mode BTs in FY2013 is shown in Fig. 1 as a bar chart, where the total BTs provided for the users' experiments and those provided for the MS experiments are indicated by blue and orange bars, respectively.

The data summary of FY2013 BTs conducted in the low-energy mode is shown in Fig. 2. The BTs are classified by the accelerator operation modes AVF, RILAC, and RRC. Experiments in which the AVF or RILAC was operated in the stand-alone mode were able to be conducted in parallel with the high-energy-mode BTs. As seen in Fig. 2, the total low-energy-mode BT in FY2013 was reduced by 50 days compared with that in FY2012. This reduction is simply due to the long-term maintenances of RILAC and RRC scheduled in FY2013.  $T_{BT} = 140.7$  days was used for 75 experiments in FY2013, which is more than 68 experiments conducted in FY2012.

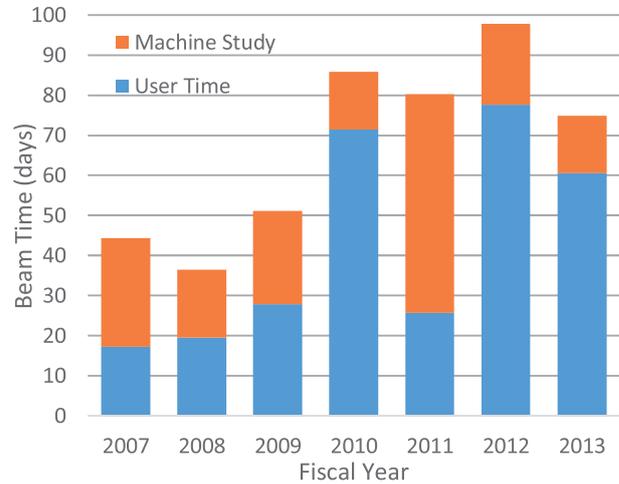


Fig. 1. Bar chart showing the BT statistics for high-energy-mode experiments from FY2007 to FY2013. The statistics of accelerator tuning time are not included.

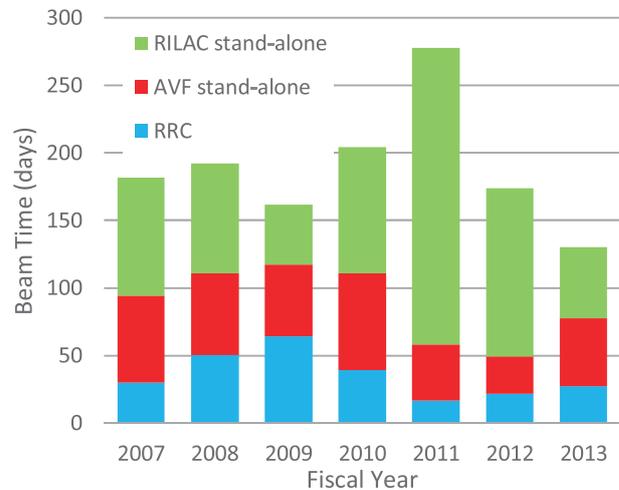


Fig. 2. Bar chart showing the BT statistics for low-energy-mode experiments from FY2007 to FY2013.

### References

- 1) K. Yoneda, K. Ishida, H. Ueno, and H. Sakai: In this report.