

Modification of beam diagnosis chambers in RILAC2 high-energy beam transport

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The vacuum chambers in the high-energy beam transport line between the RILAC2 and the RRC have been modified in order to extend the beam diagnosis devices such as a beam profile monitor and movable slits. Figure 1 indicates the schematic view of the beam line. The vacuum level in the section including a rebuncher located at S31 (S3-REB) has also been enhanced by mounting additional vacuum pumps in an arrangement previously presented in report 1. The modifications are listed as follows.

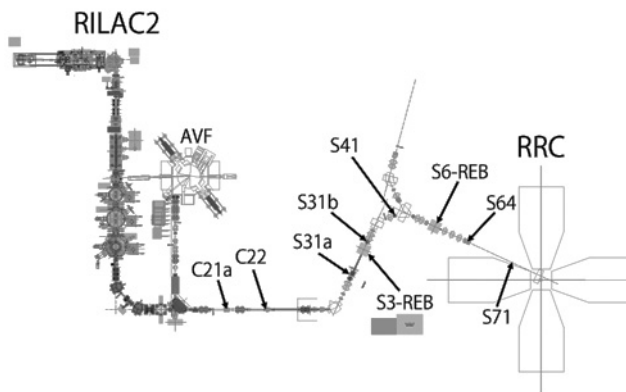


Fig. 1. Schematic view of high-energy beam transport between RILAC2 and RRC.

- location C22 (just upstream of the wall between the AVF and RRC vault):
The existing vacuum chamber has been replaced by a larger one to increase the number of the port for movable slits that define the beam emittance of RRC injection by combining with the slits at location C21a. A plastic scintillator for time-of-flight measurement, a beam attenuation mesh, a 220 L/s turbo molecular pump, and a beam stopper for radiational safety are also mounted on the C22 chamber. A wire-scanning beam profile monitor will be attached on the chamber to check the beam size on the plastic scintillator.
- location S31a (upstream of the S3-REB):
The existing chamber has been replaced by a middle-sized chamber used for a standard in RIBF. A 350 L/s turbo molecular pump has newly been attached to the S31a chamber to improve the vacuum level. A beam attenuation mesh, a wire-scanning beam profile monitor, and a Faraday cup

are mounted on the chamber as well.

- location S31b (just downstream of the S3-REB):
A new small chamber has been installed only for mounting a wire-scanning beam profile monitor. This beam profile monitor is used to adjust the beam trajectory in the S3-REB section by combining with the beam profile monitor at S31a.
- location S41 (just downstream of the singlet quadrupole (Q) magnet):
A beam profile monitor chamber located at S40 (just upstream of the Q-magnet) and a vacuum gate valve located at S41 have been exchanged with the aim of checking the degree of dispersion corrected by the Q-magnet. A 220 L/s turbo molecular pump has been mounted on the S41 chamber.
- S6-REB (rebuncher located at the S61):
Two gate valves have been installed at each end of the S6-REB. This installation enables maintaining the devices without breaking the vacuum in the long section between S41 and S71.
- location S64:
A new large vacuum chamber has been installed, as shown in Fig. 2. A plastic scintillator, a beam attenuation mesh, a wire-scanning beam profile monitor, a build up secondary-electron suppressor, a Faraday cup, and a 220 L/min turbo molecular pump have been attached to the chamber. Two other diagnosis devices are expected to be appended onto the chamber. A fast current transformer (C.T.) has newly been installed just upstream of the chamber.

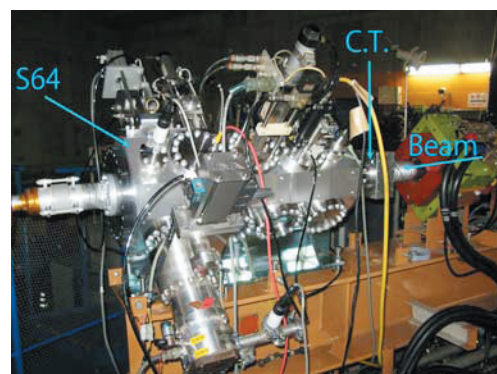


Fig. 2. Photograph of the new chamber installed at S64.

References

- 1) K. Yamada et al., RIKEN Accel. Prog. Rep. **45**, 99 (2012).

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