

Construction status of the Rare-RI Ring (R3)

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The Rare-RI Ring (R3) was constructed smoothly¹⁾, and the installation of the magnets and power supplies were completed by the end of March 2013. Subsequently, we tested a cooling water conduction of the magnets and prepared the interlock system for the magnets in order to perform the excitation tests of the magnets. The excitation test was successfully completed at the beginning of July 2013. Subsequently, we performed the precise magnet alignment by using a laser tracker. All the magnets were aligned to the design value by less than 0.1 mm. Figure 1 shows the picture of R3 at the beginning of July 2013.



Fig. 1. Picture of R3 at the beginning of July 2013.



Fig. 2. Vacuum pump combination using TMP, ion pump, and NEG pump.

Next, we installed vacuum pumps and vacuum

gauges. Figure 2 shows a vacuum pump combination for the arc section. The turbo molecular pump (TMP) is movable, and is used as a rough pumping system with a scroll pump. The nominal pumping speed of the TMP is 250 L/s for N₂. Ion and non evaporable getter (NEG) pumps are used for the ultra-high vacuum condition. The nominal pumping speed of the ion pump is 500 L/s for N₂ and that of the NEG pump is 2000 L/s for H₂. The combination of the ion and NEG pumps for R3 is 26 units.

In order to bake the R3 chamber, we installed heater wires on all the chamber surfaces and glued a heat insulator, which is an alumina-silica sheet, onto the heater wires, as shown in Fig. 3. The chamber surface is typically warmed up to about 250 °C. K-type thermocouple is used for thermal control.

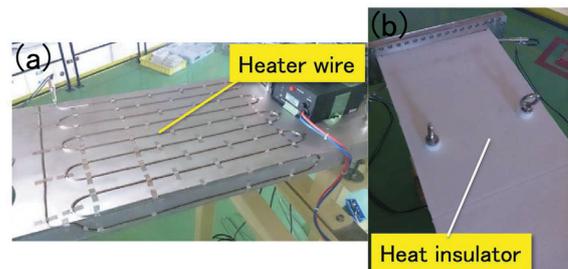


Fig. 3. Straight section of an R3 chamber. (a) heater wire and (b) a heat insulator.

Recently, we succeeded in establishing a control system for power supplies by using EPICS²⁾. In addition, we confirmed that a vacuum-integrated control system worked normally. We are now testing beam-monitoring systems^{3,4)} and a kicker system. We will carry out an off-line performance test for R3 using the α source.

References

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