

Operation of the RCNP Cyclotron

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A summary of the performance of the AVF and the Ring cyclotron in 2006 is given in Table 1. The main topics in 2006 are the commissioning of an 18 GHz superconducting ECR ion source and the development of the flat-top accelerating system of the AVF cyclotron. They are described in this volume in detail [1, 2]. A ⁸⁶Kr²³⁺ beam will be accelerated up to 8.5 MeV/u by the AVF cyclotron and used for experiments next year.

Table 1: A summary of operational statistics

Beam time	Beam time for experiments	G	104 ^h 46 ^m
		K	186 ^h 22 ^m
		WS	1650 ^h 29 ^m
		WSS	134 ^h 31 ^m
		WN	298 ^h 47 ^m
		N0	604 ^h 02 ^m
		EN	44 ^h 20 ^m
		ES	225 ^h 57 ^m
		ESS	31 ^h 00 ^m
		Total	3280 ^h 14 ^m
	Tuning of beam for experiments		398 ^h 53 ^m
	Developments		2168 ^h 35 ^m
	Total		5847 ^h 42 ^m
	Scheduled maintenance and set up for experiments		1154 ^h 38 ^m
Shutdown	Scheduled shutdown and holidays		1397 ^h 42 ^m
	Unscheduled shutdown		359 ^h 58 ^m
	Total		1757 ^h 40 ^m
Total			8760 ^h 00 ^m

On January 18, there happened a water leak in the No. 2 RF cavity of the Ring cyclotron. It was a cooling channel of the upper tuning panel. The panel was disassembled and we found that a weld was eroded by a high-pressure water after a long time operation since the construction. The beam accelerator was resumed on February 16 after a temporary repair. During the summer maintenance period, both the upper and lower panels of three cavities were disassembled and all the welds were covered by stainless steel plates, see Fig. 1.

The beam usage of the cyclotron is summarized in Table 2. About 62 % of the beam time was carried out with protons. Demand for heavy ions is expected to be increased, because the new ECR ion source has successfully become available. The operation statistics from 1977 are shown in Fig. 2. Until 2002, statistics in the FISCAL YEAR are shown and those in the CALENDER YEAR are shown later than 2003.

Table 2: A summary of the beam usage of the RCNP cyclotrons



Figure 1: Stainless steel plate covering welds.

Particles	
Proton	2920 ^h 28 ^m
Pol. Proton	731 ^h 49 ^m
Deuteron	112 ^h 30 ^m
Pol. Deuteron	655 ^h 36 ^m
³ He	407 ^h 20 ^m
⁴ He	219 ^h 14 ^m
⁶ Li	153 ^h 05 ^m
⁷ Li	169 ^h 49 ^m
¹² C	30 ^h 00 ^m
¹⁶ O	253 ^h 52 ^m
¹⁹ F	50 ^h 54 ^m
²² Ne	77 ^h 00 ^m
⁴⁰ Ar	66 ^h 25 ^m
Total	5847 ^h 42 ^m

