

THE NEW EVACUATION SYSTEMS OF THE RCNST TANDEM
ACCELERATING TUBE

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In 1979, as the evacuation systems of the RCNST tandem accelerating tube, those of 10 inches mercury diffusion pumps were replaced by those of turbomolecular pumps. The turbomolecular pumps are Sargent Welch model 3133C's and 1500 l/sec of pumping speed.

The aims of the replacement were to reduce necessary labours for the operation of the evacuation systems, to attain higher vacuum and to relise continuous evacuation of the accelerating tube for holidays that had been prevented by necessity of periodical supply of liquid nitrogen in the case of the mercury diffusion pump.

On June 30, in 1980, the evacuation system of the positive ion accelerating tube has been operated for 7497 hours and that of the negative ion accelerating tube, for 5257 hours. The attained degrees of vacuum are 3×10^{-7} Torr at the outlet of the positive accelerating tube and 4×10^{-7} Torr at the inlet of the negative ion accelerating tube. Those were stopped previously for the stoppage of electric current, for the suspension of water supply and for holidays longer than two days. But on usual Sunday those are continuously operated, and the machine time of the accelerator increased by a day every week.

In the next table there are shown main improvements by the replacement.

Table 1 Main improvements by the replacement of the evacuation systems

	Before the replacement	After the replacement
Labour for the operation	Supply of liq. N ₂ (3 hours/day)	Periodical observation and recording
Consumption of liq. N ₂	70 l/day	not necessary
Ultimate vacuum		
Neg. Acc. tube	2×10^{-6} Torr	4×10^{-7} Torr
Pos. Acc. tube	1.7×10^{-6} Torr	3×10^{-7} Torr
Power consumption	8 kw	2.1 kw