

"Upgrade of the accelerator facility in 2020"

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The Research Center for Nuclear Physics has an accelerator facility equipped with an AVF cyclotron and a ring cyclotron. The upgrade work of the accelerator facility has begun in 2019 to revive the AVF cyclotron and improve the performance and functionality so that it can supply high-quality beams with higher intensity in order to supply short-lived RI production and secondary particle beams such as neutrons, muons, and unstable nuclei for the research of physics, medical science and material science. In 2019, renovation of the accelerator facility building and mechanical and electrical equipment was mainly implemented. In 2020, renewal of the AVF cyclotron equipment has been proceeded.

In order to improve the beam intensity, the renewal of the equipment was performed about the following items:

1. Dee electrode was replaced from single-Dee to double-Dee for the purpose of enhancement of turn separation of accelerated beams and extraction efficiency (figure 1).
2. Injection energy was increased from 15kV to 50kV and according to it, inflector electrodes were newly designed and manufactured (figure 1).
3. RF system was replaced to provide the higher frequency of 18~36 MHz (figure 2).
4. Vacuum pump system was replaced from diffusion pumps to cryo-pumps to improve the vacuum inside the vacuum chamber of the AVF cyclotron (figure 2).

These renewal has been completed in March 2021, and then beam commissioning will be performed.



Figure 1. Photograph of the inside of the vacuum chamber of the AVF cyclotron with the upper yoke lifted by the renewed yoke lifter.

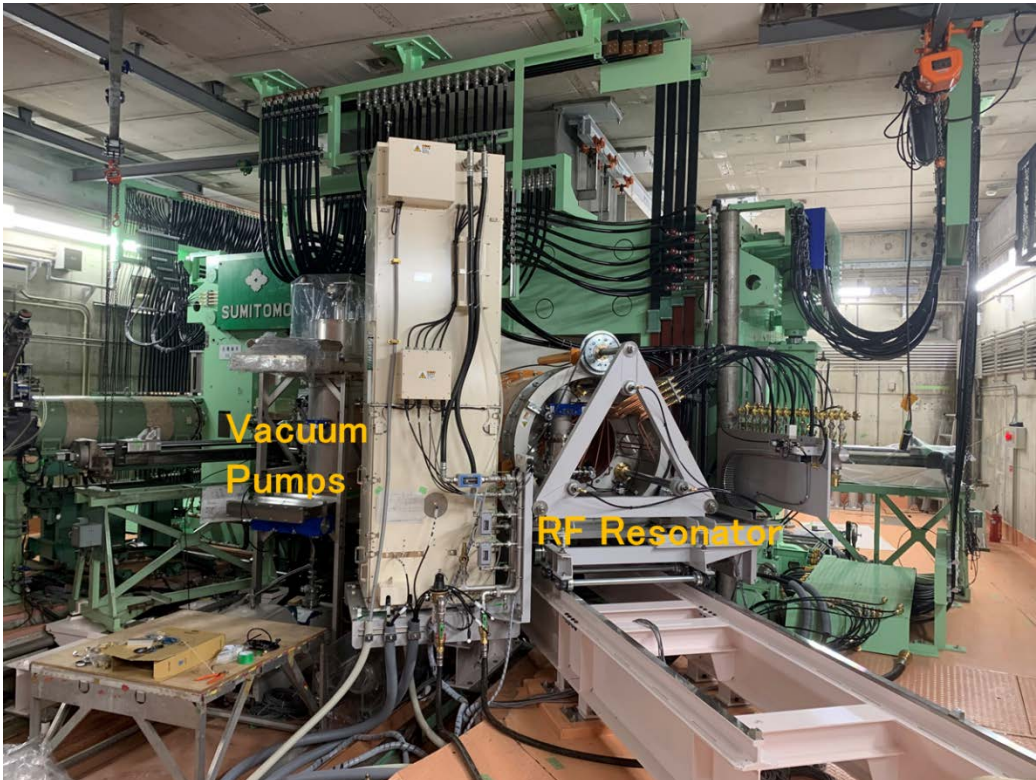


Figure 2. 2 Photograph of the AVF cyclotron viewed from a south-east corner.