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Status of ECR ion source at RAON

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RAON (Rare isotope Accelerator complex for ON-line experiments) is a particle accelerator constructed in South Korea for research in nuclear physics, materials science, medicine, and related fields.
To stably produce and accelerate ion beams, three types of ECR ion sources are planned for operation: a 28 GHz ECR ion source, a 14.5 GHz ECR ion source, and a spare ECR ion source.
The 28 GHz ECR ion source, currently under development, is designed to generate heavy ion beams such as U^{33+} and U^{34+}, and is composed of a fully superconducting magnet system.
The 14.5 GHz ECR ion source was manufactured by PANTECHNIK and installed in our beamline in September 2020. Initial beam conditioning of the RAON accelerator is being carried out using the 14.5 GHz ECRIS.
The spare ECR ion source, currently under development, is a hybrid type consisting of permanent magnets and superconducting magnets. At present, only the magnet assembly has been completed, and the design process is ongoing.

In this paper, we summarize the various issues encountered during the research, development, and operation of the three types of ion sources and discuss the future directions for further research and development.

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