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Intense highly charged Ion beam production and the status of FCER

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The world's first Nb₃Sn and NbTi superconducting electron cyclotron resonance (ECR) ion source, FCER (First 4th-generation ECR ion source), has been deployed in the LEAF (Low Energy high-intensity heavy ion Accelerator Facility) project in 2024. Following initial tuning, under 28+45 GHz microwave heating, the FCER successfully produced 350 eμA of Bi³⁵⁺ and 620 eμA of Bi³¹⁺ ion beams. Recently, to further enhance the performance of the FCER, a 32.9 GHz microwave system was installed to replace the original 28 GHz system. As a result, a series of intense Xe and Bi ion beams were generated under high microwave power conditions. These results indicate that increasing the microwave frequency significantly improves the performance of the ion source. In the future, the FCER will aim to produce high-current, highly charged ion beams at the mA level.

Footnotes

Funding Agency

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