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Operation and development of the 28 GHz electron cyclotron resonance (ECR) ion source at the facility for Rare Isotope Beams (FRIB)

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FRIB has now been in operations for over 2 years and deliver beam to the nuclear physics users with high reliability and high efficiency. Two ECR ion sources are used to produce a high charge state heavy ion beam including a 28 GHz capable, superconducting ECR that has been used for the scientific program since the beginning of 2023. Central to the performance of the FRIB accelerator are a superconducting linac and a charge stripping system allowing the primary beam to reach energies above 200 MeV/u and a beam power on the fragmentation target above 10 kW with only a few tens of microamperes required from the ECR ion source. This beam power was achieved for many primary beams including Uranium and has been used routinely for experiments over the past year. FRIB plan to increase the beam power available to users in steps from 20 kW next year and ultimately up to 400 kW. This presentation goes over the operation of the ECR ion sources at FRIB with emphasis on the 28 GHz ECR ion source including solid beam production and plan for intensity ramp up using our 10 kW 28 GHz gyrotron and operation of the superconducting magnet. Finally plans for a second and third superconducting ion source are presented.

Footnotes

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Yes

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