

RECOMBINATION OF ANALYZED MULTIPLE-CHARGE STATE HEAVY-ION BEAMS EXTRACTED FROM AN ECR ION SOURCE

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Abstract

A prototype injector capable of producing multiple-charge-state heavy-ion beams has been constructed at ANL. The injector consists of an ECR ion source, a 100-kV platform and an achromatic Low Energy Beam Transport (LEBT) system. Several charge states of bismuth ions from the ECR have been extracted, accelerated to an energy of 1.8 MeV, separated and then recombined into a high quality beam ready for further acceleration. This technique allows us to double heavy-ion beam intensity in a high-power driver linac for a future radioactive beam facility. Another application is in post-accelerators of radioactive ions based on charge breeders. The intensity of rare isotope beams can be doubled or even tripled by the extraction and acceleration of multiple charge state beams. Experimental results of multiple-charge state beam studies will be reported.

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