International Conference on Electromagnetic Isotope Separators and Related Topics (EMIS 2015)



Contribution ID: 127

Type: Oral Presentation

The CARIBU gas catcher

Wednesday, 13 May 2015 11:10 (20 minutes)

The CARIBU facility provides neutron-rich radioactive beams at low-energy or reaccelerated to energy up to 10-15 MeV/u for experiments addressing issues in nuclear physics, nuclear astrophysics and various applications. The source for these radioactive ions is a large high-intensity gas catcher used to thermalize neutronrich recoils from the fission of a 1 Ci 252Cf source. This approach provides fast and essentially universal extraction of all fission fragments and delivers a low-emittance beam suitable for high-resolution mass separation and post-acceleration. The CARIBU gas catcher operates successfully under extreme conditions with intense neutron, alpha particle and fission recoil bombardment while extracting reliably a total of 107 to 108 short-lived radioactive ions per second. The technical developments that allow this performance level will be presented, together with a detailed characterization of the results obtained thus far, and a discussion of further improvements being implemented to reach total extracted radioactive beam intensities well above 108 ions per second.

This work is supported by the Office of Nuclear Physics under Contract DE-AC02-06CH11357.

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Session Classification: Session 11