

Abstract Submitted
for the DNP00 Meeting of
The American Physical Society

Sorting Category: 12.b (Experimental)

Characterization of a Batch-Mode Cs-Sputter Negative Ion Source for RIB Generation¹ YUAN LIU, G. D. ALTON, J. R. BEENE, G. D. MILLS, S. N. MURRAY, Oak Ridge National Laboratory, Oak Ridge, TN USA — Negative radioactive-ion beams of isotopes with lifetimes in excess of a few hours can be efficiently generated in batch-mode. In this scenario, species of interest are sequentially produced by irradiating target materials with light-ion beams for a time period comparable with their half-lives followed by transfer of the target to a Cs-sputter ion source where the irradiated target material is sputtered by a 1-5 keV Cs⁺ beam for negative-ion generation. We have developed a batch-mode Cs-sputter negative-ion source for generation of radioactive-ion beams of long-lived species for use in nuclear physics and nuclear astrophysics research programs at the Holifield Radioactive Ion Beam Facility. The source features a water-cooled target wheel that holds eight separate targets; each individual target can be remotely rotated from the primary-ion-beam production position to the Cs-sputter position. The target wheel is designed so that a production target can be exposed to the primary ion beam while generating negative-ion beams from a previously irradiated target. The source has been characterized for the future generation of several long-lived species such as ⁵⁶Ni and ¹⁸F during off-line tests with stable beams. The design features, operational parameters, emittance and measured efficiencies of the source will be presented in this report.

¹Research supported by the U.S. Department of Energy under contract DE-AC05-00OR22725 with UT-Battelle, LLC.

Yuan Liu

yliu@ornl.gov

Prefer Oral Session

Prefer Poster Session

Physics Division, Oak Ridge National Laboratory

Date submitted: June 30, 2000

Electronic form version 1.4