

Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Characterization of the MARS Velocity Filter for Low Velocity Ions¹ K.R. LAWRENCE, Florida A&M Univ., M.C. ALFONSO, A. AL-HARBI, E. BERDUGO, P.J. CAMMARATA, C.M. FOLDEN III, Cyclotron Institute, Texas A&M Univ. — A program to study the heaviest elements using the MARS separator at the Cyclotron Institute at Texas A&M University has begun. MARS is typically used for light energetic ions, which travel at high velocities ($>0.08c$). The velocities of transactinides after production are on the order of $0.02c$. This project aims to characterize MARS velocity filter for low velocity ions. Offline experiments to detect alpha particles emitted were conducted using ^{241}Am as a source. The source was covered with $50 \mu\text{g}/\text{cm}^2$ ^{nat}C to prevent contamination and ^{nat}Al degraders were used to reduce the velocity of α -particles emitted by source. The separator was tuned with the velocity filter off and no degrader in place. The velocity filter was turned on and the electric field was set. The magnetic field was varied and the rate was measured. This was repeated for different electric field settings for degraders with thicknesses of $6 \mu\text{m}$, $12 \mu\text{m}$, and $18 \mu\text{m}$. Data from the offline experiments were analyzed to determine the acceptance of the velocity filter for ions $<0.06c$. The results suggest that the acceptance of the velocity filter decreases as the electric field increases, ranging from $\pm 6.3\%$ to $\pm 2.2\%$ over the fields under study.

¹Funded by DOE, NSF-REU Program and College of Science, TAMU.

Kevin Lawrence
Cyclotron Institute, Texas A&M Univ.

Date submitted: 03 Aug 2009

Electronic form version 1.4