

Abstract Submitted  
for the APR09 Meeting of  
The American Physical Society

**Precision Mass Measurements of Heavy  $^{252}\text{Cf}$  Fission Fragments Near the Astrophysical r-Process Path<sup>1</sup>** J. VAN SCHELT, G. SAVARD, S. CALDWELL, M. STERNBERG, ANL and Chicago, J.A. CLARK, J.P. GREENE, A.F. LEVAND, T. SUN, B.J. ZABRANSKY, ANL, J. FALLIS, K.S. SHARMA, Manitoba, D. LASCAR, R.E. SEGEL, Northwestern, G. LI, McGill — Precision mass measurements of species near the path of the astrophysical r-process—expected to occur in core-collapse supernovae or neutron star mergers—are vital to reduce the uncertainties in the relevant neutron separation energies given by mass models and the consequent predictions of nucleosynthesis yields. As part of an ongoing program, the Canadian Penning Trap mass spectrometer at Argonne National Laboratory is measuring the masses of fission products from a 150  $\mu\text{Ci}$   $^{252}\text{Cf}$  source placed inside a large-volume He gas catcher. Presented measurements include Pr, Nd, Pm, Sm, Eu, and Gd to  $N = 96, 97, 98, 99, 98,$  and  $99$  respectively with precisions near  $15 \text{ keV}/c^2$ , and our results differ from the AME 2003 by up to  $390 \text{ keV}/c^2$ . Measurements of many more neutron-rich isotopes will be made in 2009 at the CARIBU upgrade to the ATLAS accelerator at ANL, which is approaching operation.

<sup>1</sup>This work has been supported by grants from NSERC, Canada and by the U.S. DOE, Nuclear Physics Division, under Contract No. DE-AC0206CH11357.

Jonathon Van Schelt  
ANL and Chicago

Date submitted: 13 Jan 2009

Electronic form version 1.4