

Abstract Submitted  
for the APR05 Meeting of  
The American Physical Society

**Investigation of Electron-beam Production of Neutron-Rich Radioactive Ion Beams**<sup>1</sup> J.J. DAS, J.R. BEENE, ORNL, W.T. DIAMOND, Chalk River Nuclear Lab, J.D. FOX, Florida State University, J.W. JOHNSON, D.W. STRACENER, M.J. SALTMARSH, ORNL — Photo-fission has been proposed for production of neutron-rich radioactive isotopes because potentially attractive absolute fission yields may be achieved with a modest-cost electron accelerator, and because the relative production of the most neutron-rich isotopes should be substantially enhanced in photo-fission compared to fission induced by protons and other light-ion beams. We intend to carry out measurements of isotopic yields in bremsstrahlung induced photo-fission of  $^{238}\text{U}$  at the Oak Ridge Electron Linear Accelerator (ORELA) at ORNL as part of an evaluation of this production method. A target for high-power electron beam irradiation at has been fabricated and tested. Fission products will be stopped in a closed-circuit, NaCl-loaded helium gas system and transported to a gamma ray detection system in order to measure the production of specific fission products. Measurements using a  $^{252}\text{Cf}$  source have confirmed that the transport efficiency is about 40% through a 30 meter, 0.75 mm diameter stainless steel tube. The target assembly is to be mounted in the ORELA target room operated with up to 10 kW of  $\sim 150$  MeV electrons.

<sup>1</sup>Supported by U.S. DOE under contract DE-AC05-00OR22725 with UT-Battelle, LLC.

James Beene  
Oak Ridge National Lab

Date submitted: 20 Jan 2005

Electronic form version 1.4