

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Mass Separation of Nuclear Waste Surrogates in the Archimedes Demonstration Unit D.L. WINSLOW, F. ANDEREGG, B.P. CLUGGISH, R.L. FREEMAN, J. GILLELAND, T.J. HILSABECK, W.D. LEE, A.A. LITVAK, R.L. MILLER, T. OHKAWA, A.P. POLOSKI, S. PUTVINSKI, S. TAUNIER, K.R. UMSTADTER, J. ZHANG, Archimedes Technology Group — The Archimedes Demonstration Unit (ADU) has successfully separated a nuclear waste surrogate into light and heavy waste streams. ADU is a large scale ($L = 3.9$ m, $a=0.37$ m) cylindrical Plasma Mass Filter¹ that utilizes perpendicular electric and magnetic fields to generate a low-pass filter on atomic mass. This technology could reduce the volume of high level nuclear waste at the Hanford site in Richland, Washington. Over the last year, several techniques have been used to evaporate and inject waste surrogates into a rotating sodium metal plasma in ADU. Both spectroscopic and material collection techniques show that the Filter reduces the amount of heavy material in the light waste stream by a factor of 20 or more, with mass collection rates of about 0.25 g/s. Results of the experimental mass separation tests, parameter scaling of the mass separation, and supporting modeling will be presented. ¹T. Ohkawa, “Plasma Mass Filter”, U.S. Patent 6 096 220, August 1, 2000.

David Winslow
Archimedes Technology Group

Date submitted: 22 Jul 2005

Electronic form version 1.4