Abstract Submitted
for the DNP08 Meeting of
The American Physical Society

Measurement of ^{39}Ar/Ar ratios using AMS on underground argon samples using the newly developed ultra-pure Al lined plasma chamber P. COLLON, M. BOWERS, Univ. of Notre Dame, F. CALAPRICE, C. GALBIATI, Princeton Univ., C.L. JIANG, D. HENDERSON, ANL, W. KUTSCHERA, Univ. of Vienna, H.H. LOOSLI, Univ. of Bern, R. PARDO, ANL, M. PAUL, Hebrew Univ. of Jerusalem, E. REHM, ANL, D. ROBERTSON, C. SCHMITT, Univ. of Notre Dame, R. SCOTT, R. VONDRASEK, H.Y. LEE, ANL — The first application of ^{39}Ar AMS at the ATLAS linac of Argonne National Laboratory (ANL) to date ocean water samples relevant to oceanographic studies was most successful and has been reported on. In particular the use of a quartz liner in the plasma chamber of the Electron Cyclotron Resonance (ECR) ion source enabled a potassium reduction of a factor ∼100 compared to previous runs without liners and allowed measurements down to ^{39}Ar/Ar = 4.2x10^{-17}. We are currently working on improving the AMS method for ^{39}Ar by following two ion source development paths to allow for higher Ar beam currents coupled to lower ^{39}K background rates. Both methods are combined with new cleaning techniques developed for removing both particulates and other materials from surfaces, largely driven by the semiconductor industry. The driving force for the use of AMS to measure ^{39}Ar is to search for a source of argon that has a low concentration of ^{39}Ar. Such a source of argon would be useful for new liquid argon detectors that are being developed for detecting dark matter WIMPs (Weakly Interacting Massive Particle), such as that to be installed at the new DUSEL (Deep Underground Science and engineering laboratory) facility at Homestake in the US.

Philippe Collon
University of Notre Dame

Date submitted: 02 Jul 2008 Electronic form version 1.4