ANL/PHY/cp-95025

First Use of a Laser-Driven Polarized H/D Target at the IUCF Cooler

M. A. Miller[1a], K. Bailey[b], J. Brack[c], R. V. Cadman[a], W. J. Cummings[b], J. Fedchak[2b], B. Fox[c], H. Gao[3b], C. Grosshauser[e], R. J. Holt[a], C. Jones[g], E. Kinney[c], R. Kowalczyk[b], Z.-T. Lu[b], W. Nagengast[e], B. Owen[a], K. Rith[e], F. Schmidt[e], E. Schulte[a], J. Sowinski[f], F. Sperisen[f], J. Stenger[4e], E. Thorsland[a], and S. Williamson[a]

[a] *University of Illinois at Urbana-Champaign, Urbana, Illinois 61801*
[b] *Argonne National Laboratory, Argonne, Illinois 60439*
[c] *University of Colorado at Bolder, Bolder, Colorado 80309-0446*
[e] *Universität Erlangen-Nürnberg, 91058 Erlangen, Germany*
[d] *Massachusetts Institute of Technology, Cambridge, Massachusetts 02139*
[f] *Indiana University Cyclotron Facility, Bloomington, Indiana 47408*
[g] *California Institute of Technology, Pasadena, California 91125*

RECEIVED
JUL 26 1999
OSTI

Abstract. The HERMES Laser-Driven Target Task Force (Argonne, Erlangen and Illinois) is charged with developing a polarized H/D target for use in the HERA ring at DESY. Rapid progress was made in the beginning of 1996, leading us to the decision to test the target in a realistic experimental environment. In particular, polarizations of 0.6 and flows above 10^{18} atoms$\cdot$s^{-1} have been achieved on the bench. The laser-driven target and a simple detector system are currently installed in Cooler storage ring at the Indiana University Cyclotron Facility in order to test its applicability to nuclear physics experiments. Target polarizations are being measured using the $\vec{\mathrm{H}}(\mathrm{p},\mathrm{p})$ and $\vec{\mathrm{D}}(\mathrm{p},\mathrm{p})$ reactions. Initial tests were reasonably successful and the target is well along toward becoming viable for nuclear physics

1) Corresponding author, miller5@uiuc.edu
2) Current address: University of Wisconsin-Madison, Madison, Wisconsin
3) Current address: Laboratory for Nuclear Science, Massachusetts Institute of Technology, Cambridge, MA 02139
4) Current address: Massachusetts Institute of Technology, Cambridge, MA 02139

The submitted manuscript has been authored by a contractor of the U. S. Government under contract No. W-31-109-ENG-38. Accordingly, the U. S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or allow others to do so, for U. S. Government purposes.