

Abstract Submitted
for the SES08 Meeting of
The American Physical Society

Experience with the UNC Polarized ^3He Target¹ TIMOTHY DANIELS, THOMAS CLEGG, ALEX COUTURE, CHARLES ARNOLD, University of North Carolina at Chapel Hill and Triangle Universities Nuclear Laboratory — We discuss our experience with the UNC polarized ^3He target² to collect for $p+^3\text{He}$ spin-correlation coefficients below 6 MeV. The use of a compact, enclosed external polarizer was convenient in a general-purpose accelerator target room, but made optimization and improvement difficult. The target initially used spin-exchange with Rb to achieve $\sim 30\%$ polarization in 24hr with a T1 of 36hr, before the original optical pumping cell was destroyed. The wide variation in performance, both individually and over time, of the 10 replacement cells we fabricated included the deterioration of T1 in individual cases after optical pumping and reversing the magnetic holding field, but no clear difference between GE-180 and Pyrex cells. The best replacement cell yielded $\sim 20\%$ polarization with a 15hr T1. Cells using a mixture of Rb and K gave similar results,³ though they reached saturation polarization in $\sim 12\text{hrs}$. A frequency-narrowed 30W diode laser⁴ produced similar results to those of the 60W broadband diode laser.

¹Work supported in part by USDOE grant #DE-FG02-97ER41041.

²T. Katabuchi *et al.*, Rev. Sci. Instrum. **76**, 033503 (2005)

³A. Couture *et al.*, Bull. Am. Phys. Soc., **51** No. 8, 20 (2006)

⁴C. W. Arnold *et al.*, Bull. Am. Phys. Soc. **51**, no 8, 20 (2006)

Timothy Daniels
University of North Carolina at Chapel Hill and
Triangle Universities Nuclear Laboratory