$^3\vec{He}$ Target Status from G_E^n

Aidan M. Kelleher

College of William & Mary

April 10, 2006

Outline

1. G_E^n Target Overall Success

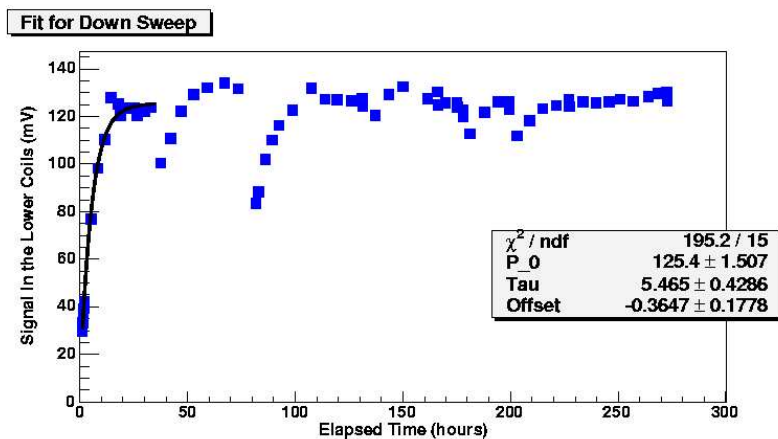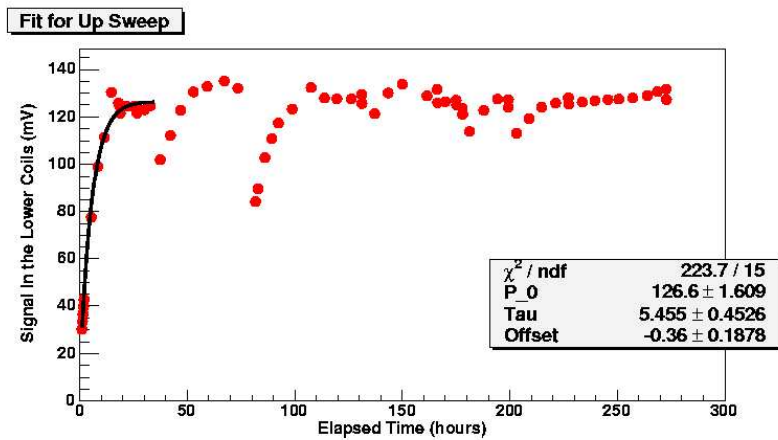2. Future Design Ideas

   (a) Ceramic Oven

   (b) NMR Signals

   (c) Other Items

G^n_E Target Successes

- Over 50% In-Beam Polarization for Edna

- Other cells performed well also: over 40%

Ceramic Oven

- Temperature Controls

  - Connected to pumping chamber

  - Should be in fixed position; shield from laser

- Heater

  - Using 1200W heaters

  - Okay to use vertically, should be after flex line

- Insulation

Ceramic Oven

- Oven Materials

  - Check for iron (helicoils are magnetic)

  - Test materials (glass mica is brittle)

- Feedthroughs

  - Instrumentation is glued into oven

  - No good access to cables

NMR Signals

- Pickup Coils

  - Current adjustability good, but can be improved (should be okay for standard coils)

- RF Coils

  - Adjustability nice, but not used too much (might be useful for more uniform field)

  - Large Coils $\rightarrow$ high power for decent $H_1 \rightarrow$ moved amp downstairs

NMR Signals

- A-Φ Box

  - Cancellation coil good, but need phase adjustment (and better mount)

  - Could use HP3324A (or other HP/Agilent function generator)

  - Standard A-Φ could be used, but needs to be tested ahead of time.

- MITEQ Pre-Amplifier

  - Can reduce noise, but needs to be matched to 50Ω

  - Matching requires resonance

  - Still not sure how good the MITEQ is at picking up NMR signals

Other Items

- EPR Signals

  - Moved amplifier into hall – got rid of cable resonances

- Cabling and Patch Panels

  - No more cables from patch panel to counting house

  - No room for power supplies for 2nd and 3rd Helmholtz coil

- EPICS and LabView

  - Might be time to change to Linux version of LabView

    * Dave Meekins already has this setup for other targets in Hall A.