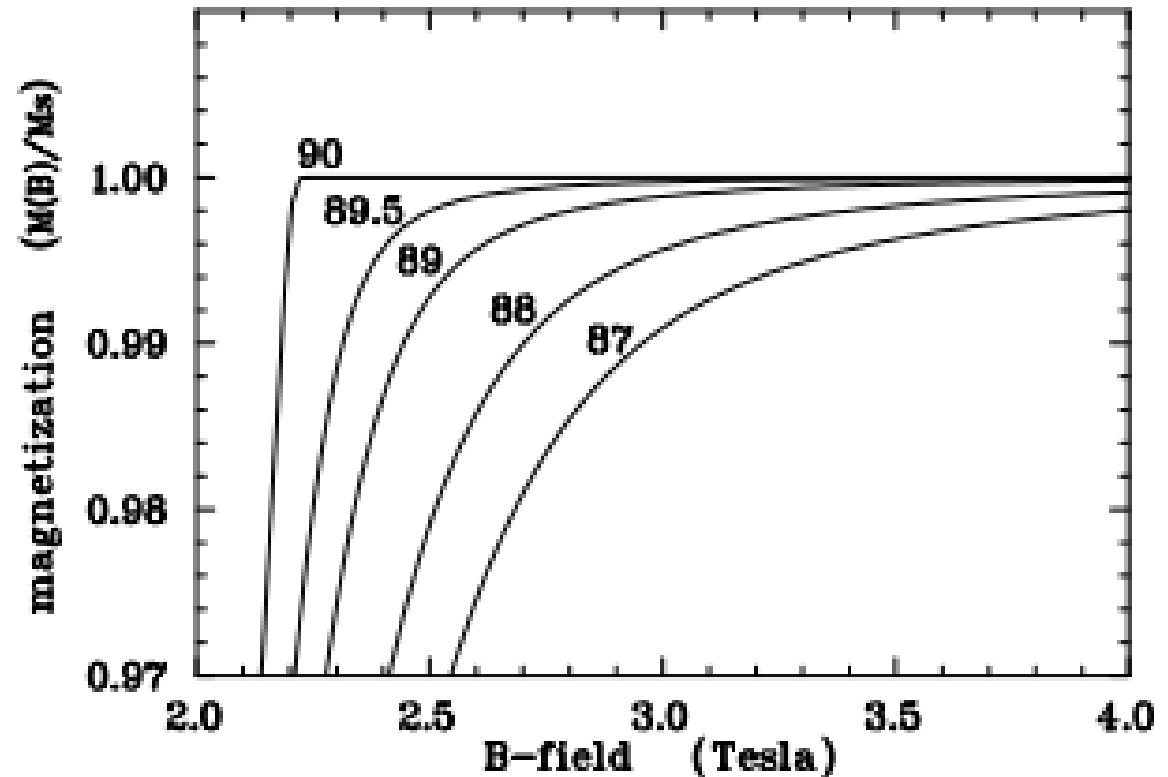


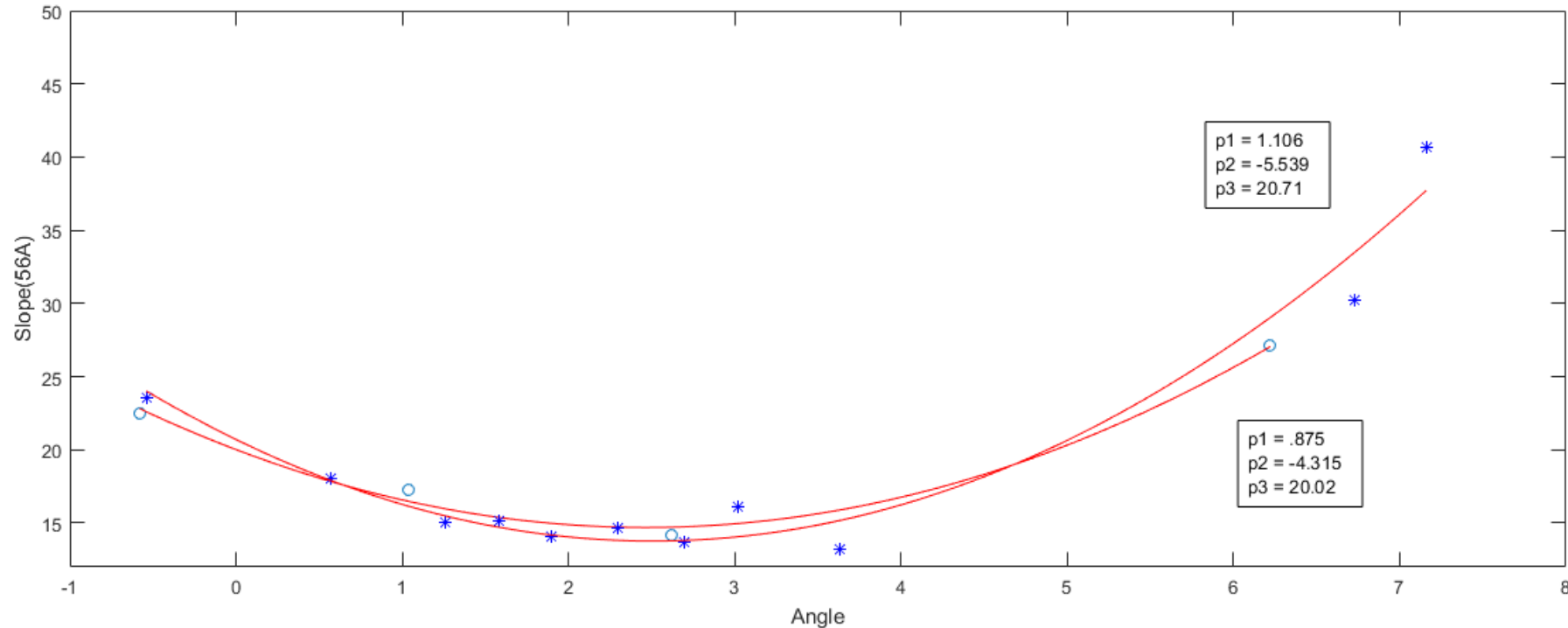
# Jlab Study Overview

# What Did We Want Accomplish?

- Wanted to explore the effects of foil/field misalignment



# What Did We Accomplish?



- Found that the measurement was not very sensitive to a  $\pm 3$  degree shift
  - Apparent discrepancy between measured 'center' (2.5 degrees) and reported 'center' (5 degrees)

# Problems To Address

- How to secure foil in magnet so that it doesn't bend/flex?
  - Measurements were made by attaching foil target to glass backing to eliminate flex
    - Not feasible in real experiment
  - Rethink target holder?
  - Build additional holder accessory to fit current design?
    - Experimental constraints on target diameter was mentioned – need a more concrete constraint to address this problem

# Problems To Address

- Need reliable iron foil polishing procedure
  - Foil needs to be flat
    - Used succession of finer sanding blocks to make foil flat
  - Foil needs to be reflective
    - Used car polish to increase foil reflectivity

# Preempt Future Issues

- My impression is that making saturation is easy as long as one follows basic optics measurement principles
  - Stationary target
  - Reflective/flat target surface
  - Properly enclose optics equipment from air currents, vibrations
- How will real experiment conditions undermine this?
  - What are the effects of electron beam on foil properties?
    - Is reflectivity degraded?
    - Is foil surface made non-flat?
  - How is measurement affected by target heating?

# Next Steps

- Keeping target stationary without a backing needs to be addressed
  - Holder prototypes/revisions should be drafted
  - Testing effectiveness is straightforward by measuring beam spot deflection as a function of magnet current
- Target heating effects seem most reasonable systematic to test next
  - Construct aluminum backing – one end attached to target foil, other end is run out of magnet and heated – target heated simply via conduction?
- Post-doc Jinlong Zhang (SBU) has taken over Kerr effect. Preliminary measurements have been successfully recreated. Efforts underway to improve setup.