

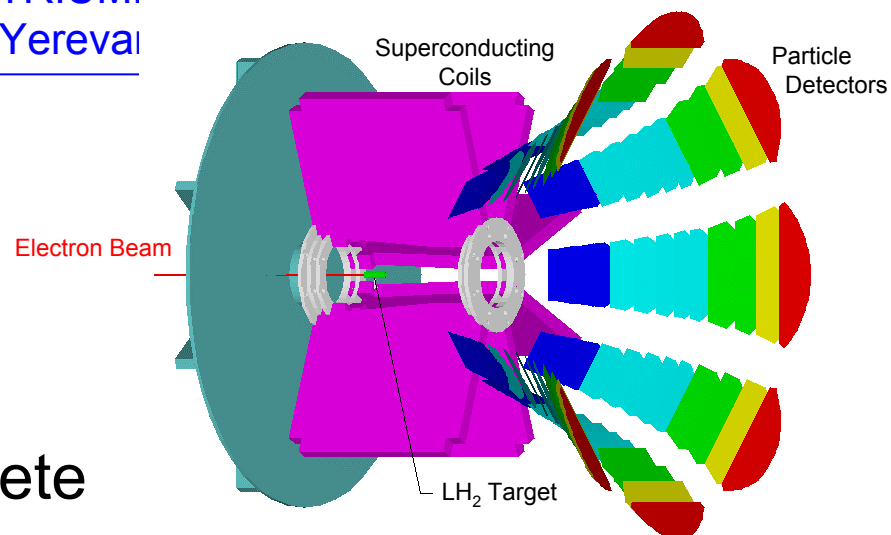


G0 Experiment: Status and Plans



D. Beck, UIUC
JLab Jun 03

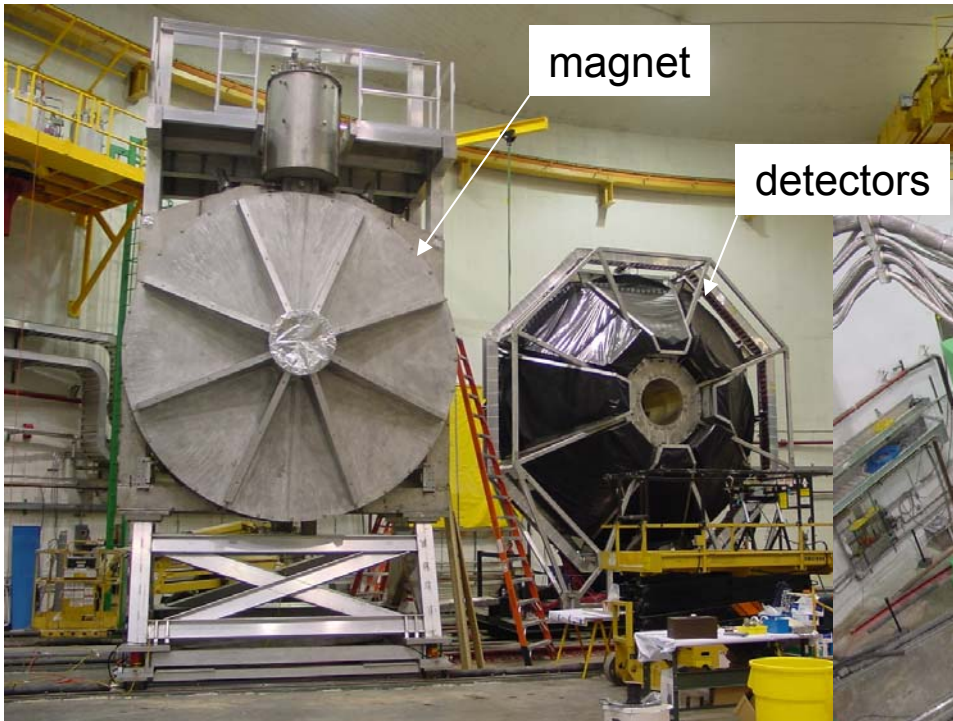
Caltech, Carnegie-Mellon, W&M, Hampton, IPN-Orsay,
ISN-Grenoble, Kentucky, La. Tech, NMSU, JLab, TRIUMF
UConn, UIUC, UMan, UMd, UMass, UNBC, VPI, Yereval



- First commissioning run complete
 - Oct 25 – Jan 23
- Magnet, target, detectors, electronics, DAQ, software operational
- Obtained ~1.5 d of test asymmetry data under operating conditions
 - clearly see weak interaction!

G0 Experiment: Status

- installation completed in late summer 2002

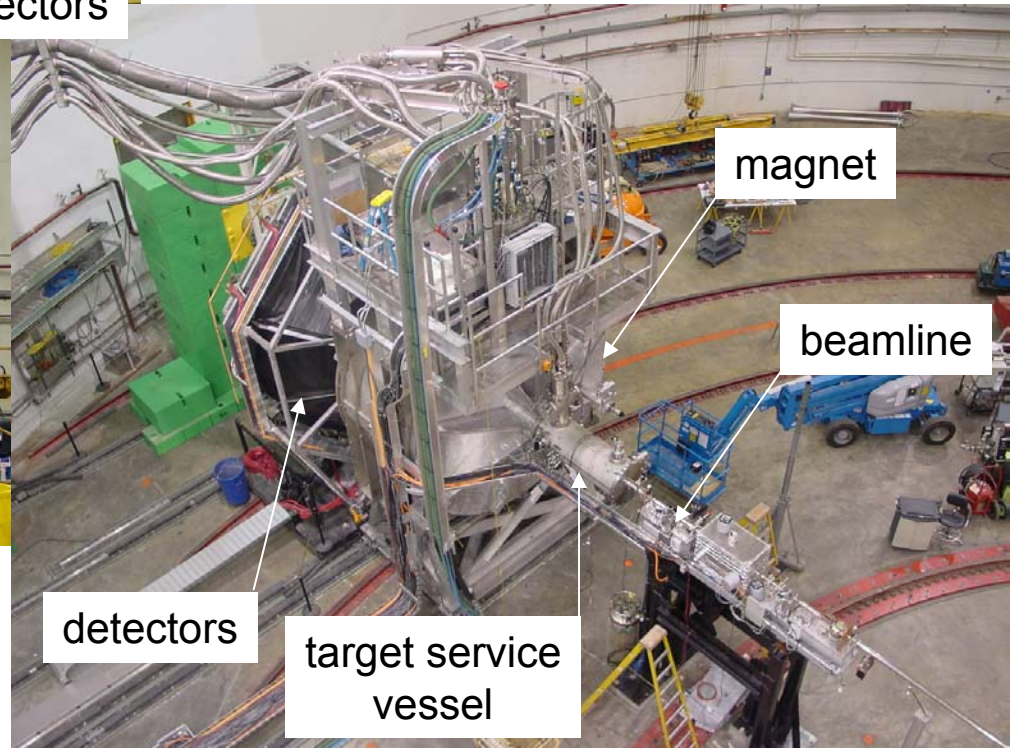


magnet

detectors

Hall C, April 02

Hall C, August 02



magnet

beamline

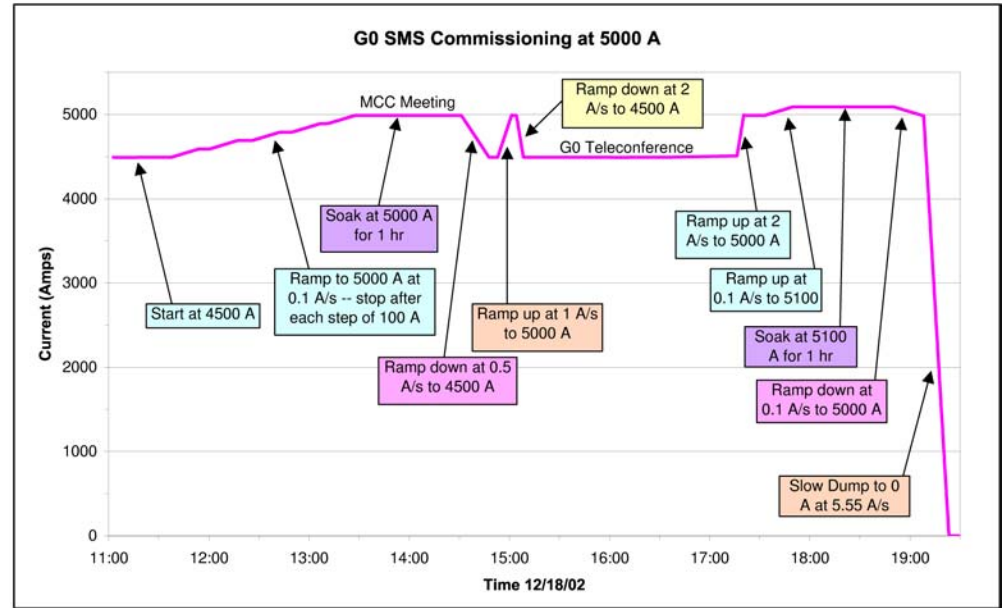
detectors

target service
vessel

G0 Experiment: Status

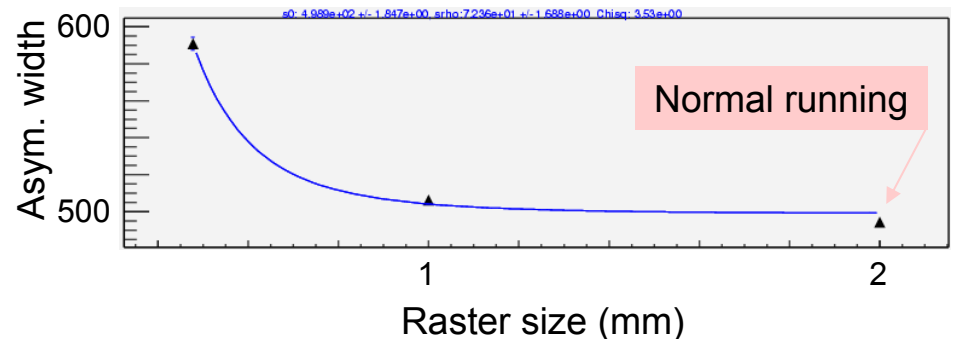
✓ Magnet operational at design current

- 5000 A, Dec. 18/02



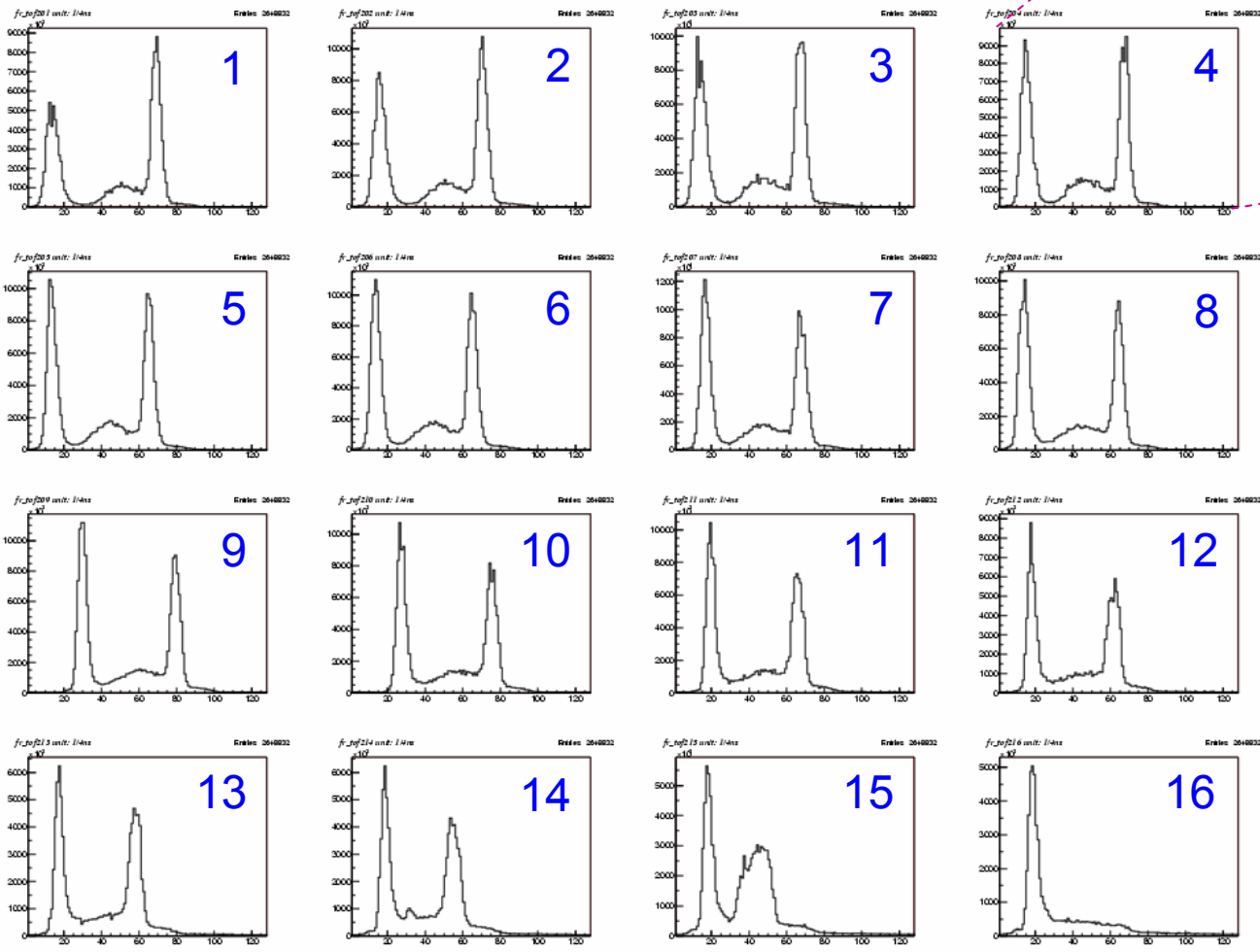
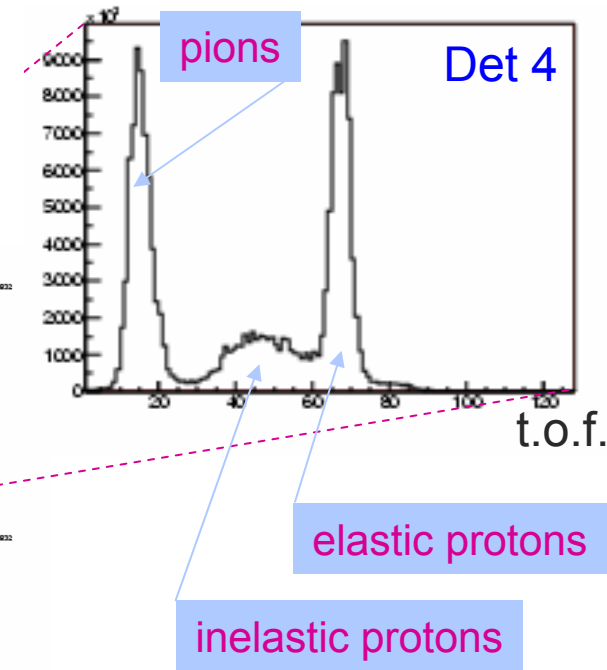
✓ Target operational at full beam current

- boiling not significant at 40 μ A



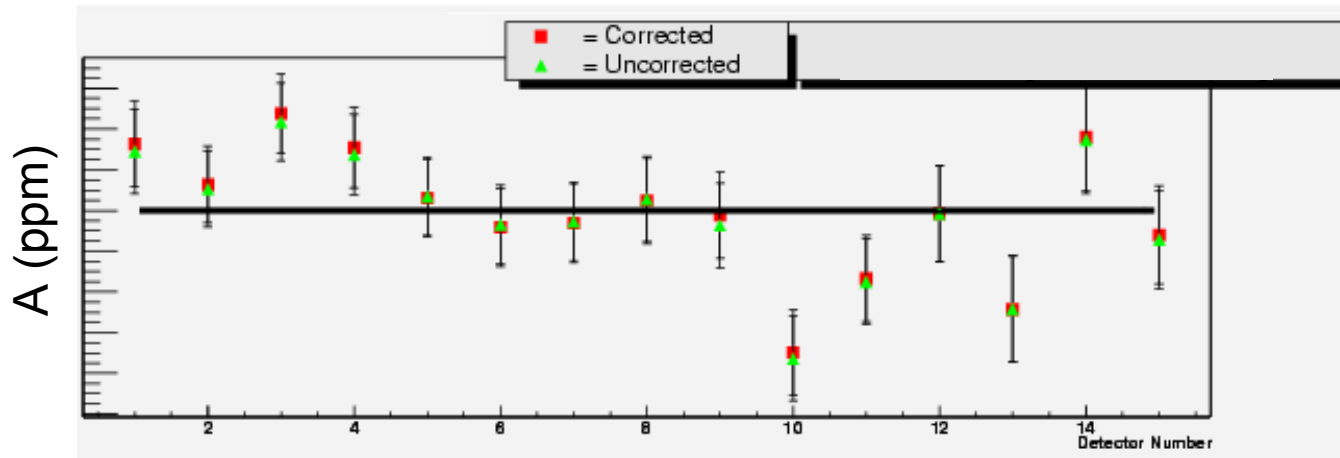
G0 Experiment: Status

- ✓ Detectors, electronics, DAQ and software all fully operational
- ✓ good t.o.f. spectra for all octants, all detectors



G0 Experiment: Current Work

- False asymmetries
 - for good beam setups, false asymmetries due to helicity-correlated beam properties are small $\sim 10^{-7}$
 - often 10x or more larger during last run



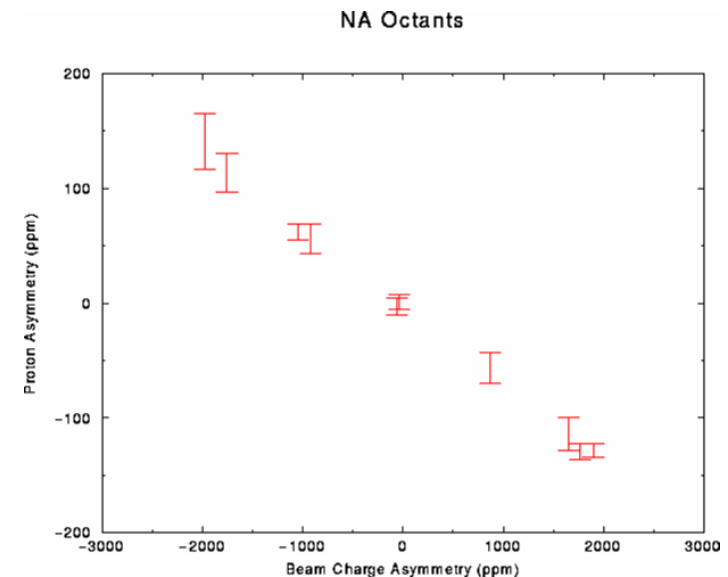
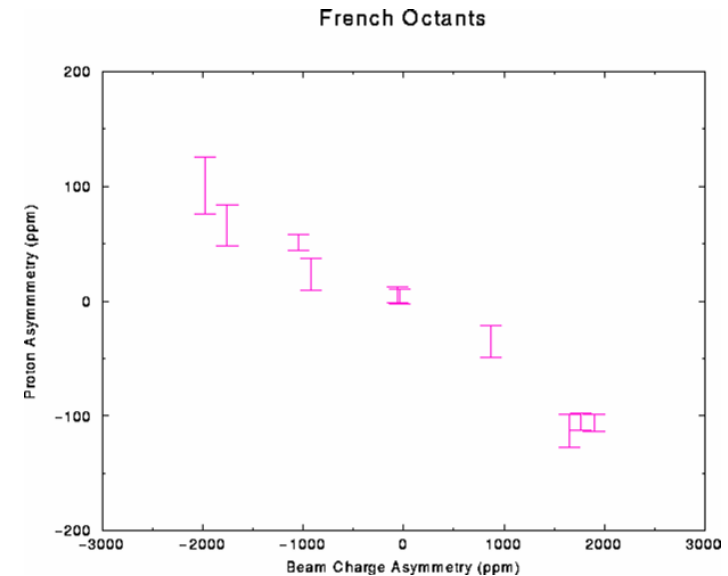
- Helicity-correlated beam charge feedback operational
- Helicity-correlated beam position feedback not operational
 - G0 collaborators diagnosing problems with polarized source laser position asymmetries and control
 - Accelerator Division launches major effort
 - establish rigorous setup procedure for injector
 - understand transverse optics from crystal to target

G0 Experiment: Current Work

- Deadtime
- False asymmetry

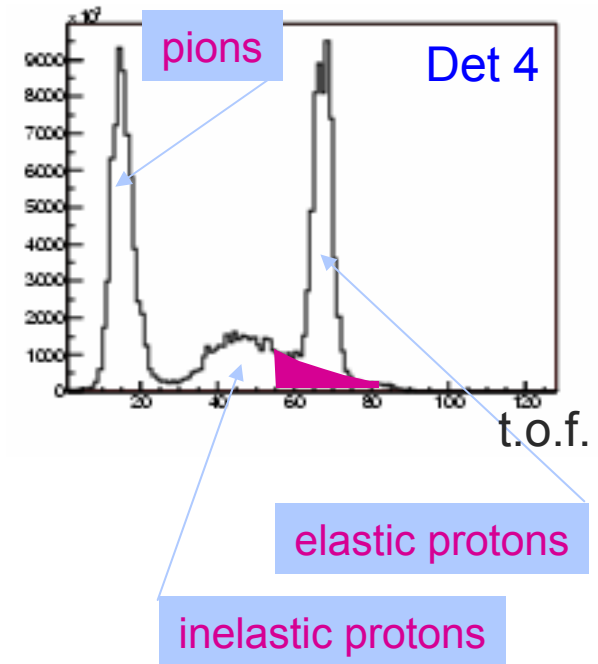
$$A_{f,deadtime} = f_{dead} A_{charge}$$

- must correct for typical deadtime of 10% and beam charge asymmetry of ~ 1 ppm
- automatically part of regression analysis of all helicity-correlated beam parameters
- NA deadtimes larger than French
 - traced to problem with LeCroy CFDs in NA electronics
 - requires adjustment of delay



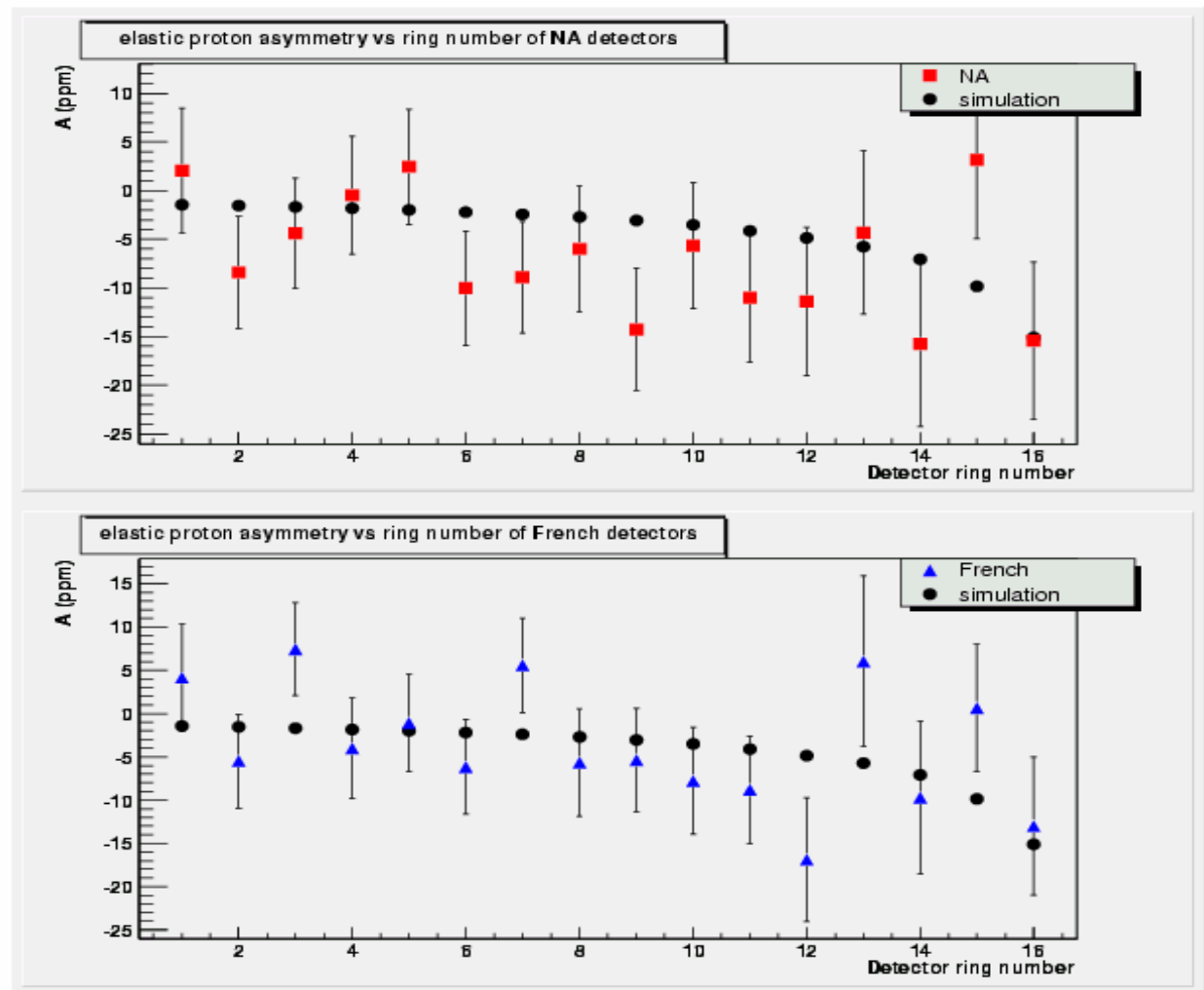
G0 Experiment: Current Work

- Background determination
- Require both yield and asymmetry to correct elastic asymmetry
 - yield: ~10 – 25% depending on detector
 - simulation → important contribution from downstream target window
 - ✓ reduce window thickness in region near beam by x2
 - ✓ add insertable dummy window (thicker) for diagnostic runs
 - asymmetry of background
 - preliminary indication $|A_{\text{back}}| \sim |A_{\text{el}}|$ near elastic peak



G0 Experiment: Status and Plans

- ✓ No unexpected false asymmetries seen
 - e.g. 10 h asymmetry data at 14 μ A beam current



- ✓ Analysis of 1.5 d of good data nearly complete, expect preliminary result by mid-summer
 - working on assessment of systematic uncertainties