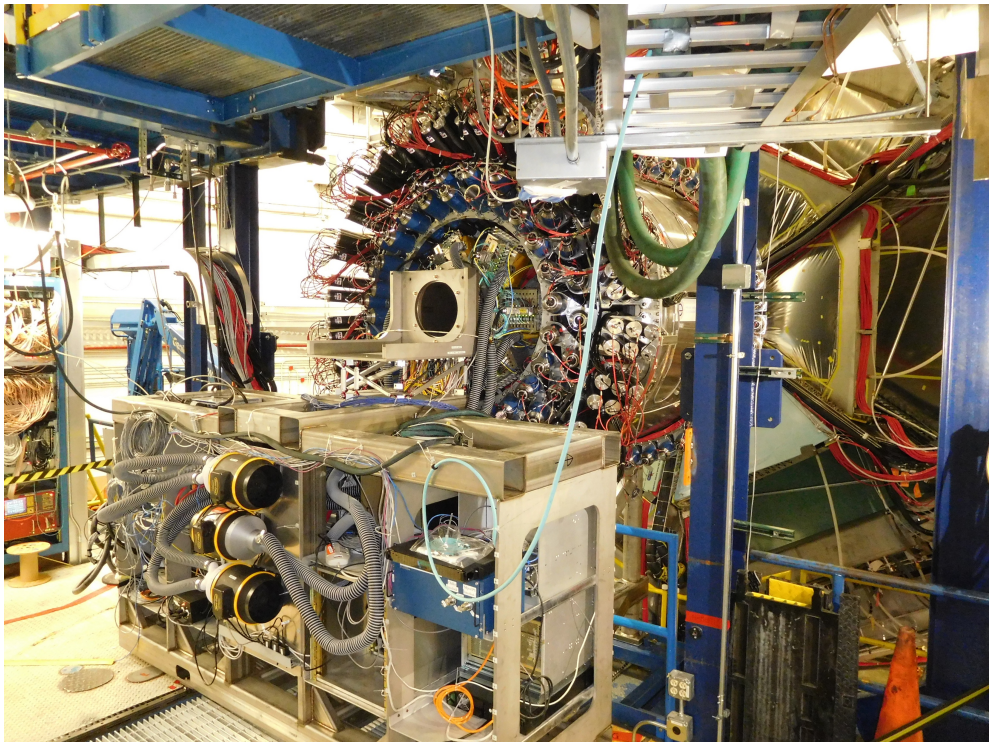
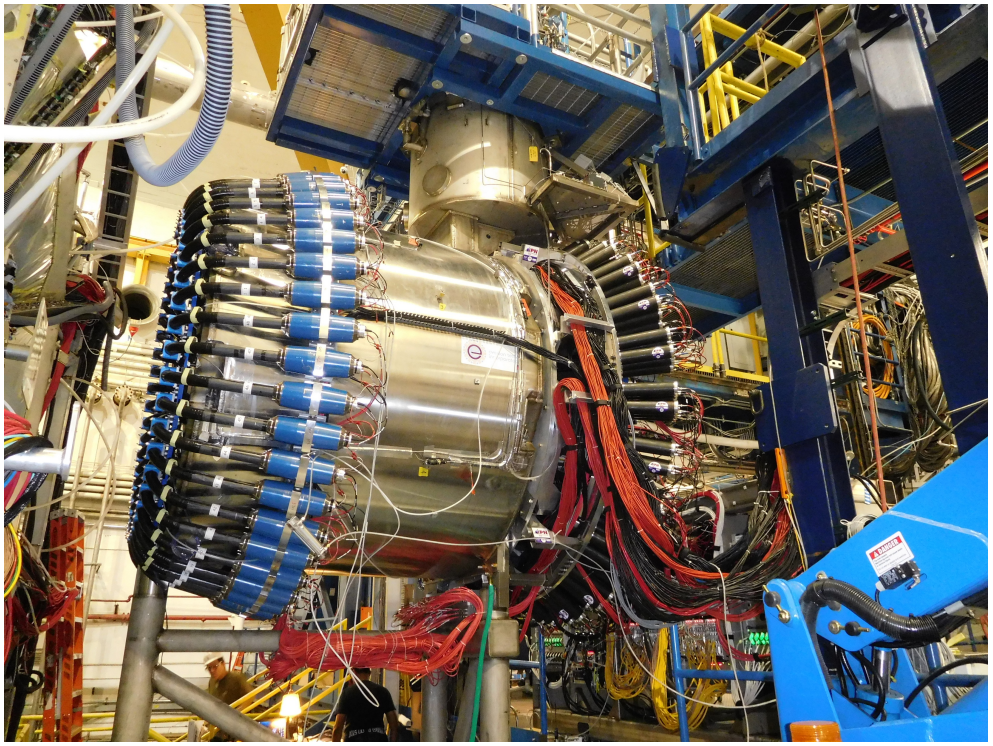
CTOF Solenoid Field Test





Field Test: Nov. 8, 2017, 3 - 11 p.m.

Magnet Team: R. Fair, P. Ghoshal, D. Kashy, N. Sandoval

Hall B Folks: S. Boyarinov, D.S. Carman, E. Pasyuk, L.C. Smith

CTOF Solenoid Field Test

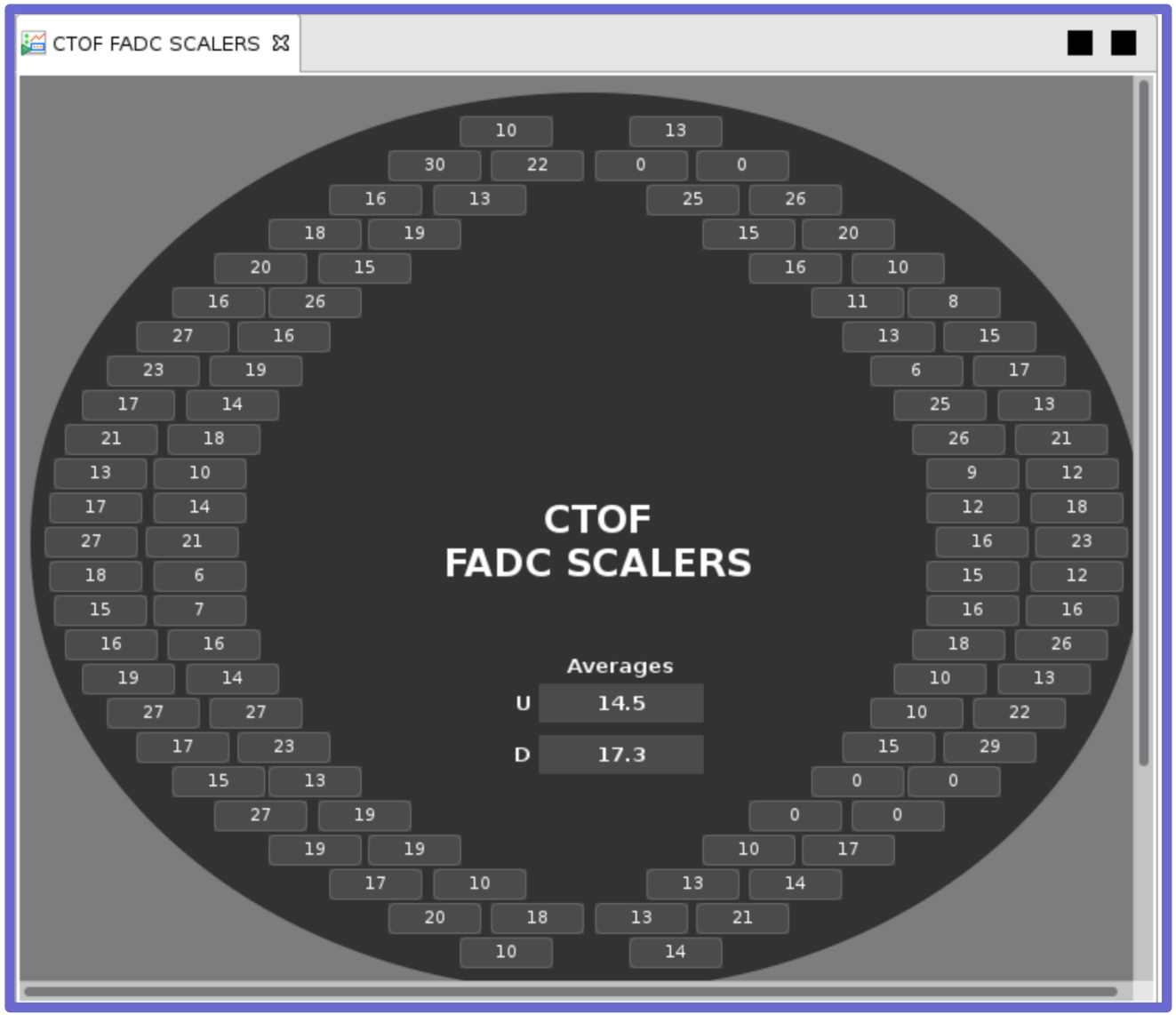
Goals:

- Test efficacy of CTOF magnetic shields as a function of the solenoid magnet field:
  - 0%, 20%, 40%, 60%, 80%, 100%
  - Measure FADC spectra for CTOF counters. Use average counter ADC spectra to quantify evidence of gain shifts vs. field
  - Measure internal magnetic field along shield axis for representative counters
  - Record 1 hour of data using a CTOF "self trigger" for offline data analysis

Notes:

- The compensation coil networks are not yet fully connected
- Counter #14 (the "last" counter) is not installed
- PMTs for counters #32U, #33U, #33D were removed to enable internal shield measurements

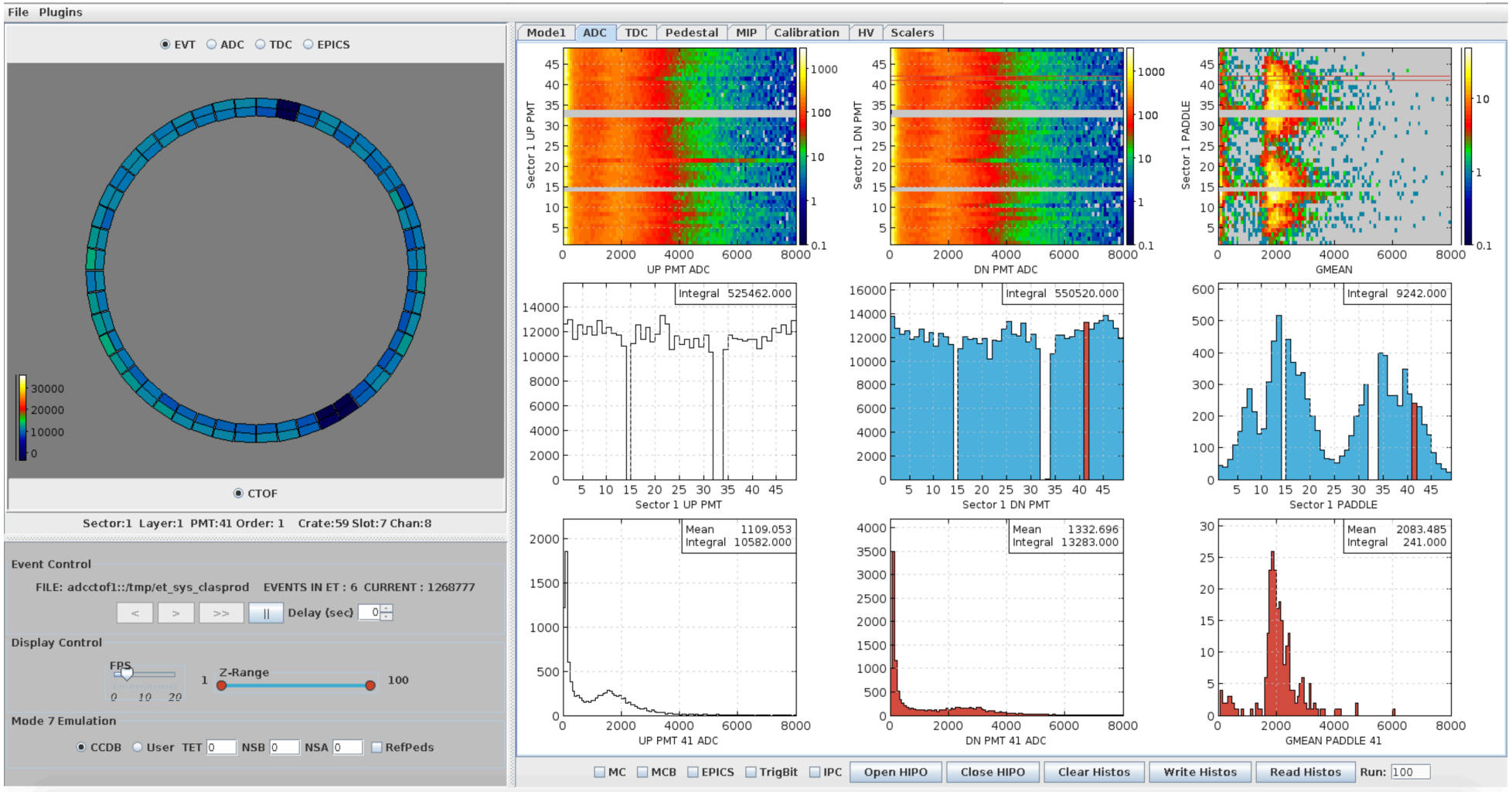
CTOF Scalers



DAQ singles rate =
OR over all PMTs
~ 125 Hz

"CTOF self-trigger"

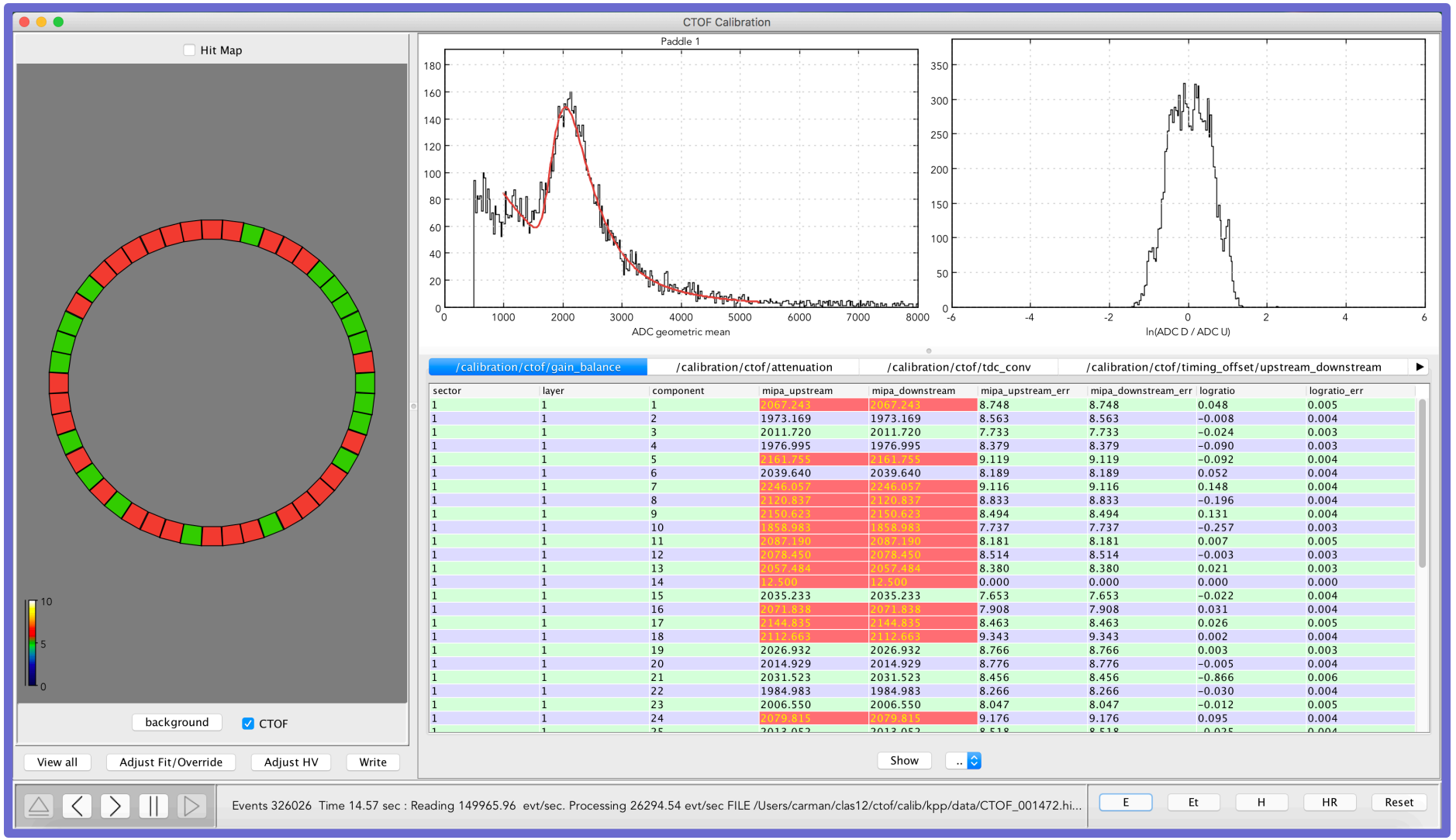
CTOF Expert Monitor



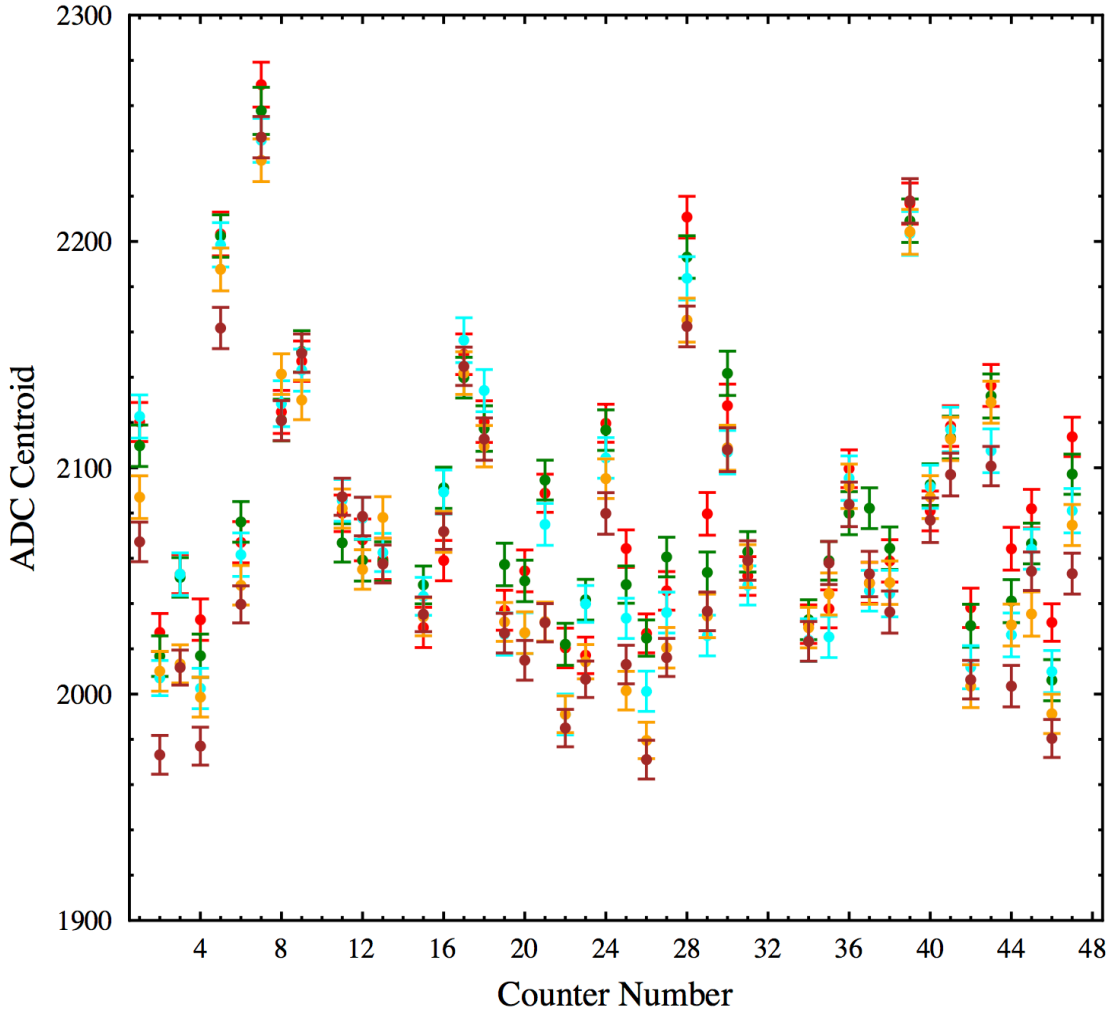
CTOFMON

Code suite to monitor ADC and TDC response of all detector channels

CTOF Calibration Suite



CTOF Field Test Results

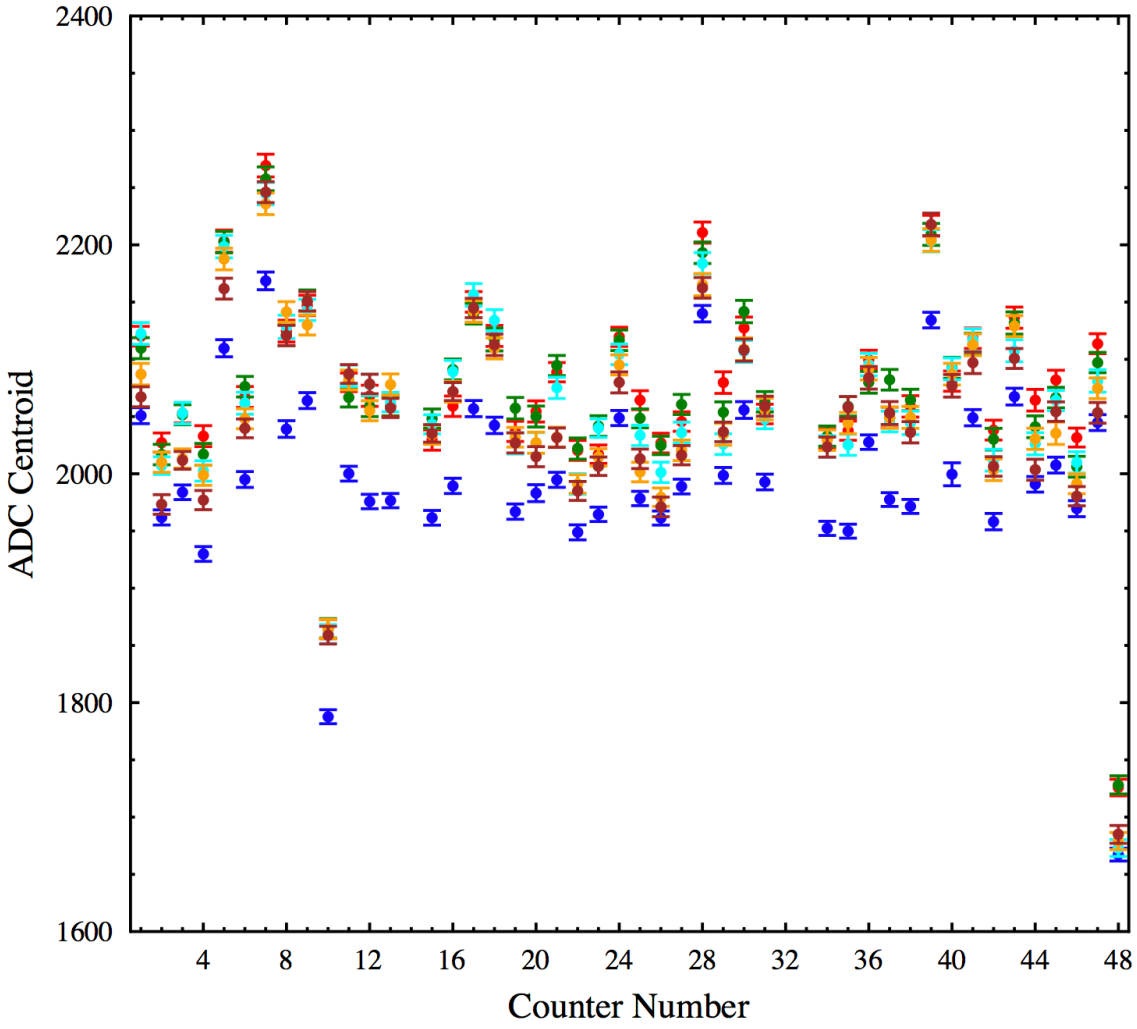


20% Field (r1468)
40% Field (r1469)
60% Field (r1470)
80% Field (r1471)
100% Field (r1472)

No shift of geometric means at any field setting

Spread of means consistent with fit uncertainties

CTOF Field Test Results

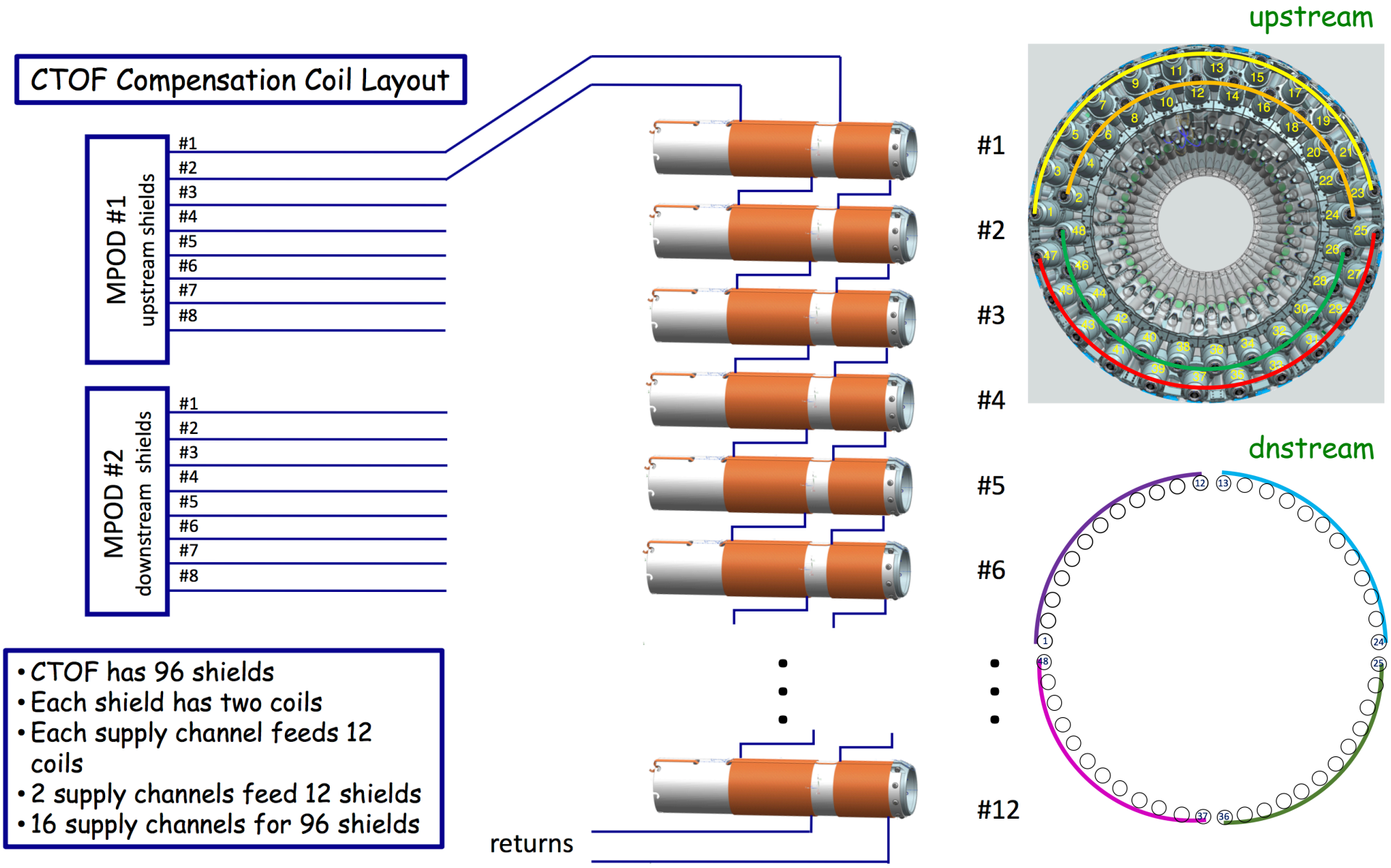


0% Field (r1466)
20% Field (r1468)
40% Field (r1469)
60% Field (r1470)
80% Field (r1471)
100% Field (r1472)

0% field values reproduced through multiple runs before and after field test

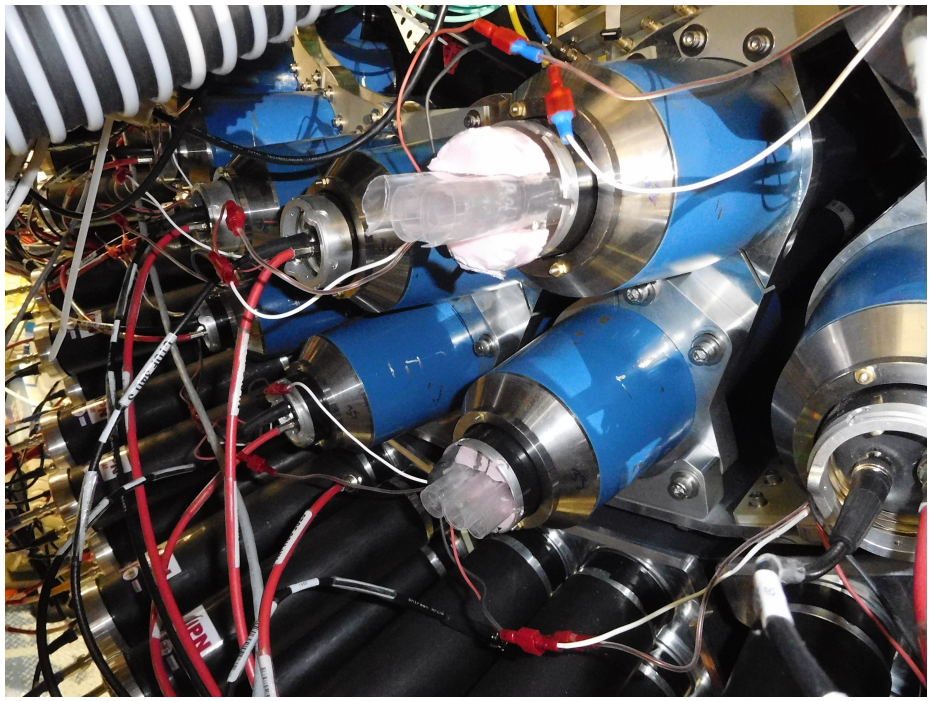
No shift of geometric means at any field setting

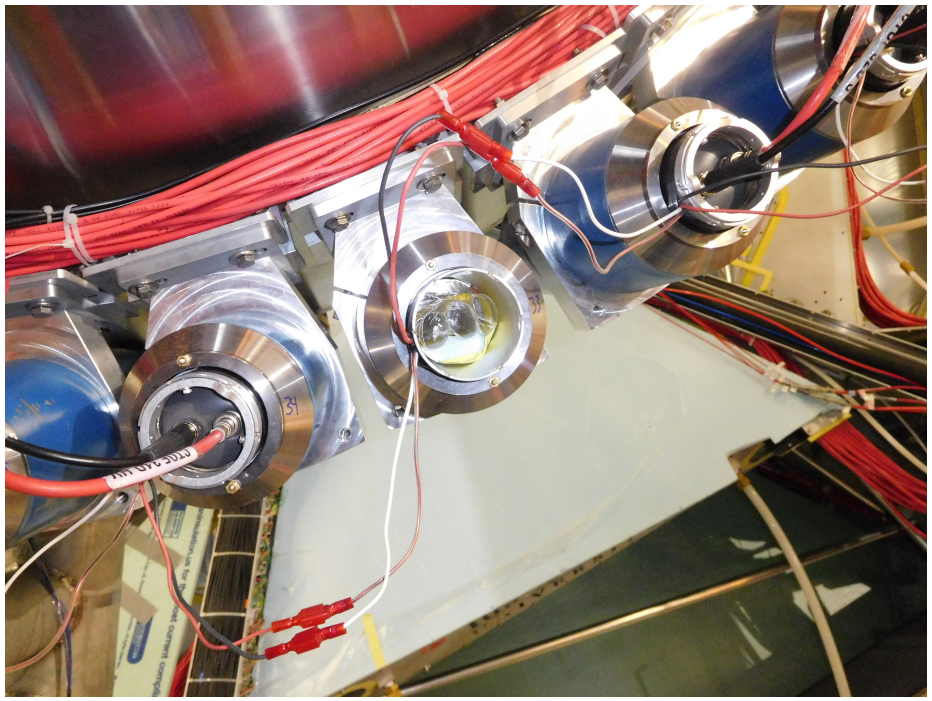
CTOF Compensation Coil Scheme

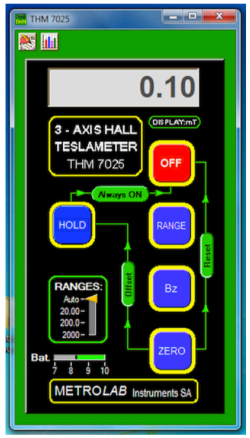


- CTOF has 96 shields
- Each shield has two coils
- Each supply channel feeds 12 coils
- 2 supply channels feed 12 shields
- 16 supply channels for 96 shields

CTOF Internal Field Measurements







All field axis measurements < 0.3 G
at all fields; level of meter accuracy