

HAPPEX Data Acquisition

- *Review and Status Report*
- *Electronics Crosstalk*

Bryan Moffit



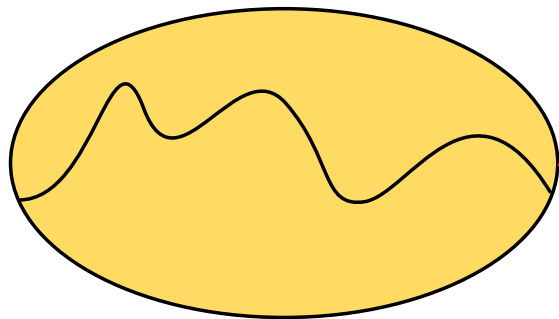
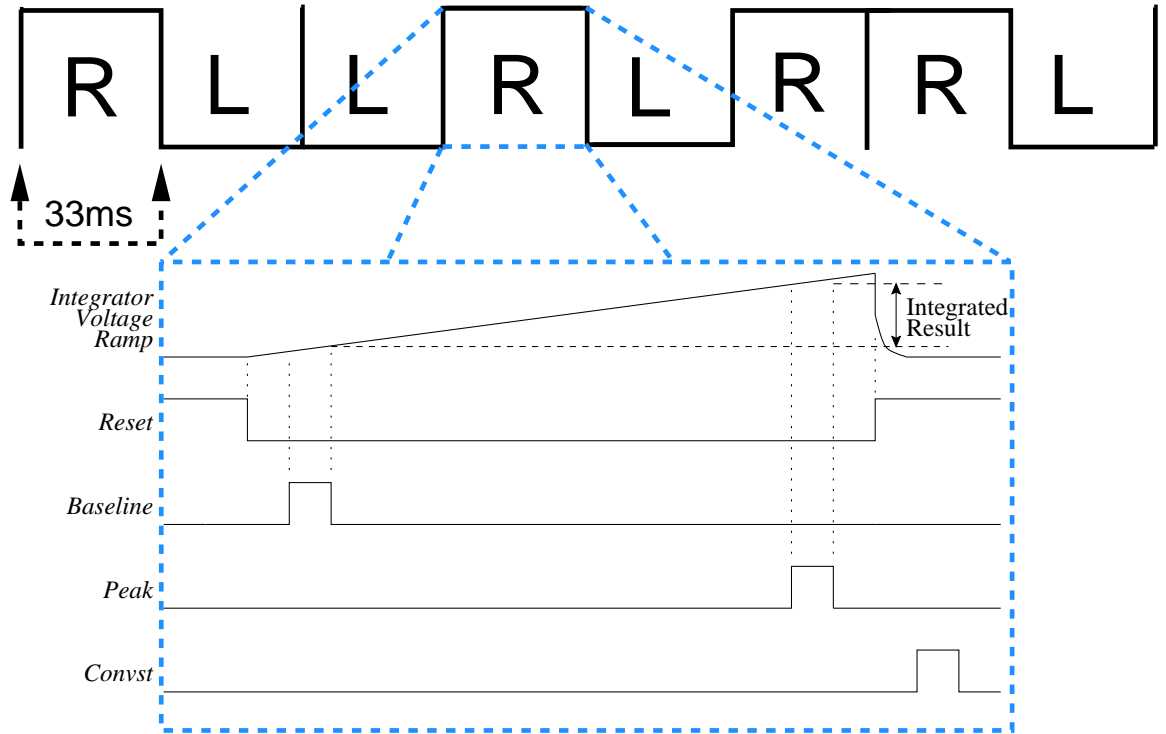
The College of _____
WILLIAM & MARY

Simple DAQ

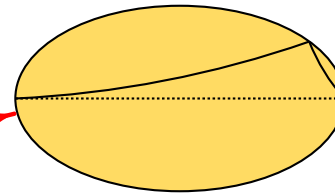
Beam Helicity



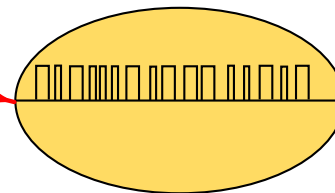
Timing Board



Detected Signals



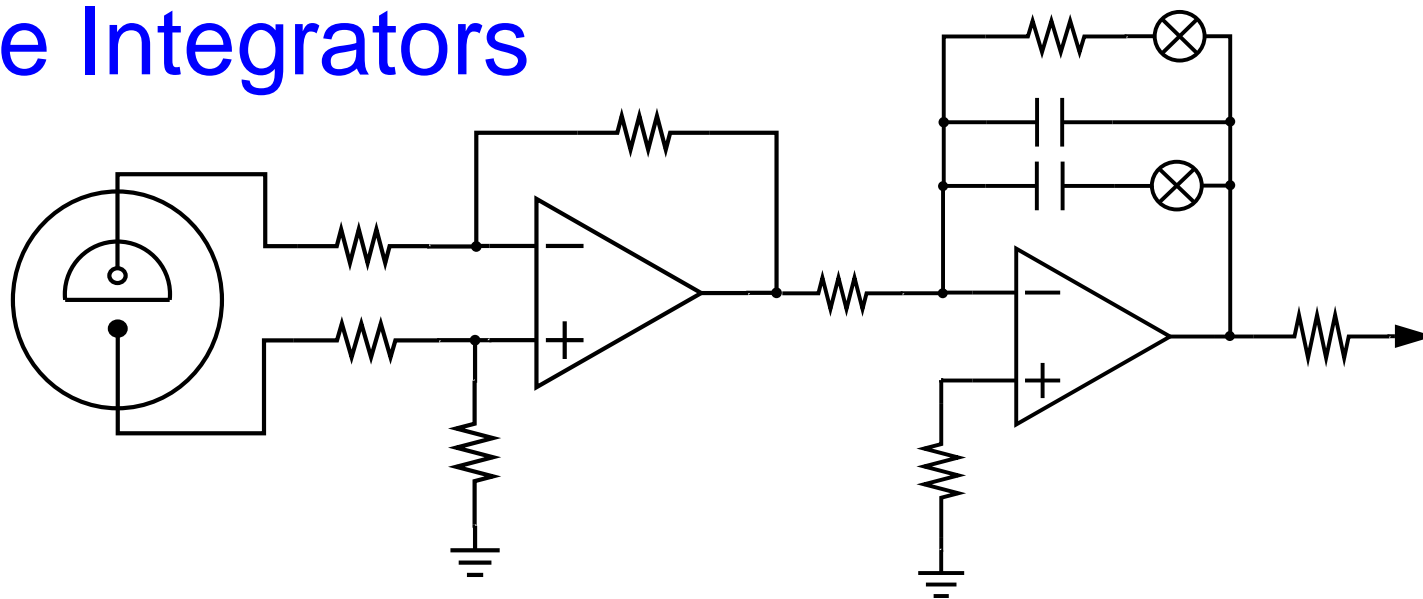
Integrating
ADCs



VtoFs
Scalers

HAPPEX ADCs

Voltage Integrators



Readout:

BPMs, BCMs, Cavity Monitors(X,Y,I), Batteries.

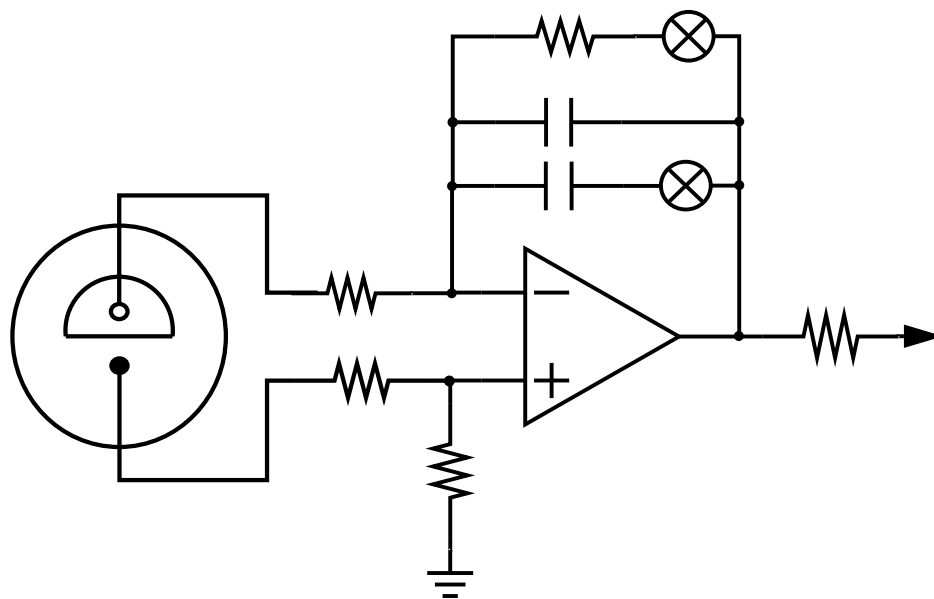
Gain settings (33ms):

LoGain: 1.6 \rightarrow 6.5V

HiGain: 0.4 \rightarrow 1.63V

HAPPEX ADCs

Current Integrators



Readout:

Detectors, LUMIs, Profile Scanner, Batteries.

Gain settings (33ms):

LoGain: $6.5\mu\text{A}$

HiGain: $1.63 \rightarrow 3.13\mu\text{A}$

HAPPEX ADC Count

Presently Working HAPPEX ADCs

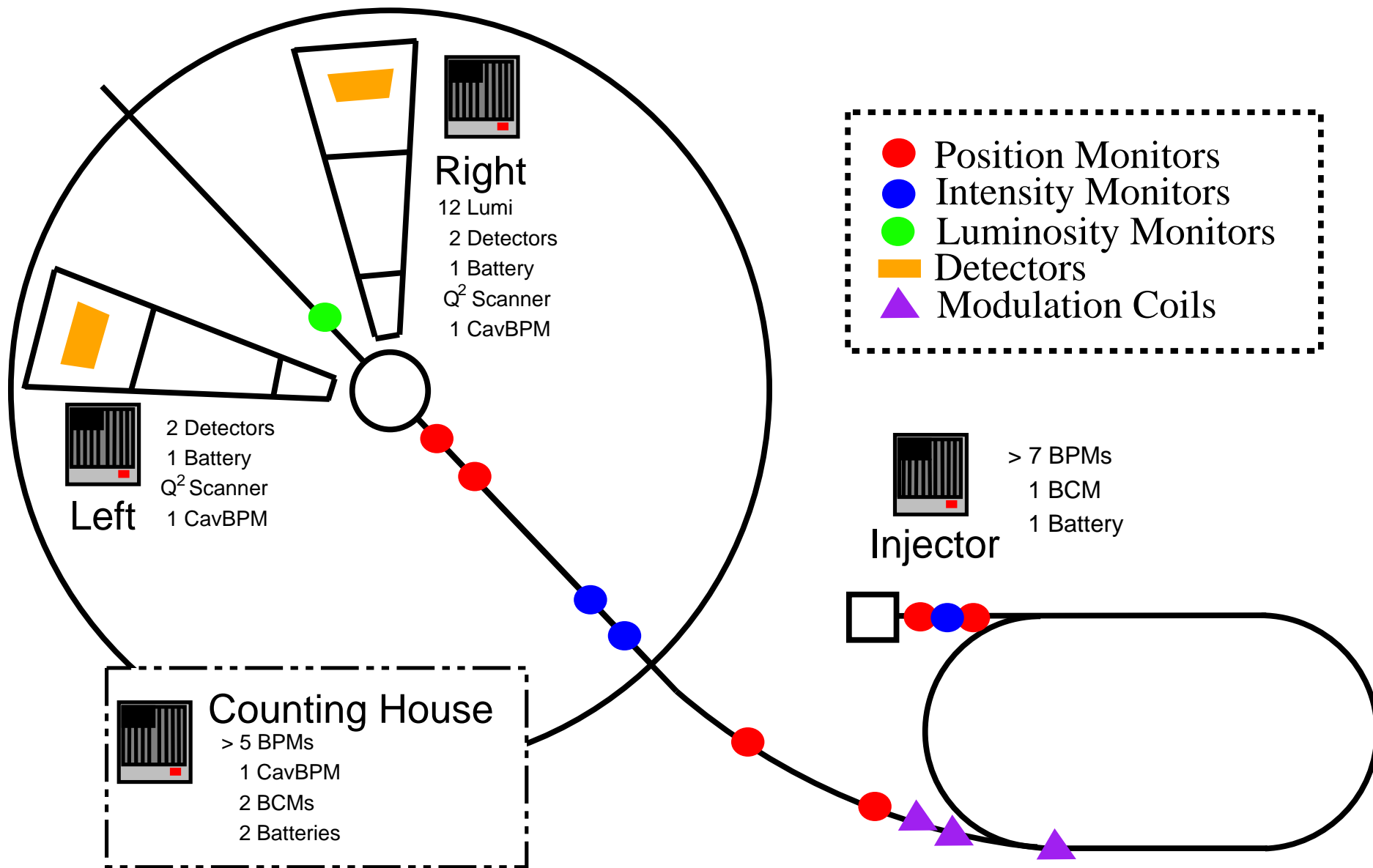
11 Voltage Integrators
4 Current Integrators

Need for Experiment

8 Voltage Integrators
5 Current Integrators

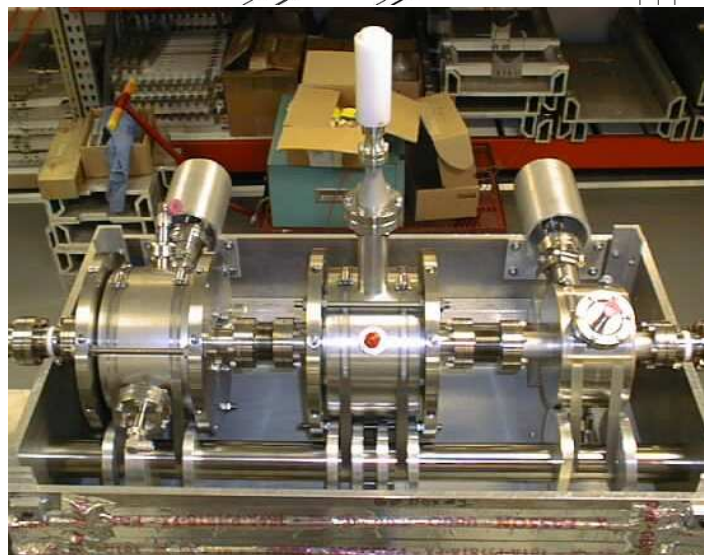
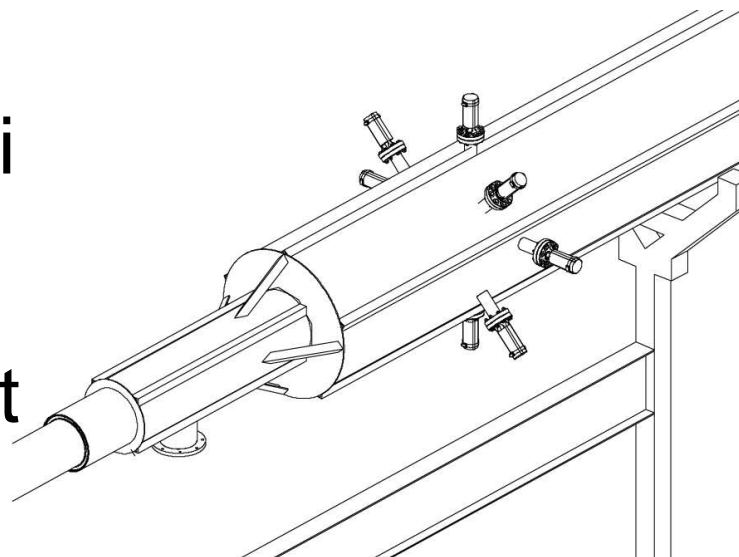
★ Want at least 2 spares (of each) ★

The HAPPEX DAQ



DAQ: To Do List

- Install/Commission Lumi
- Commission Cavities
- Profile Scanner Readout
- Convert ADCs
→ Current Integrators
- Install Crate in
Left Spectrometer
- Integrate ↔ Singles
Mode switch



Electronics Crosstalk

Statistical Error from detector: $\sim 80\text{ppb}$

Largest Pedestal Noise $\sim 9\text{chan} \rightarrow 90\text{ppm}$

Goal: 40ppb

~ 4 days of pedestal data

This analysis:

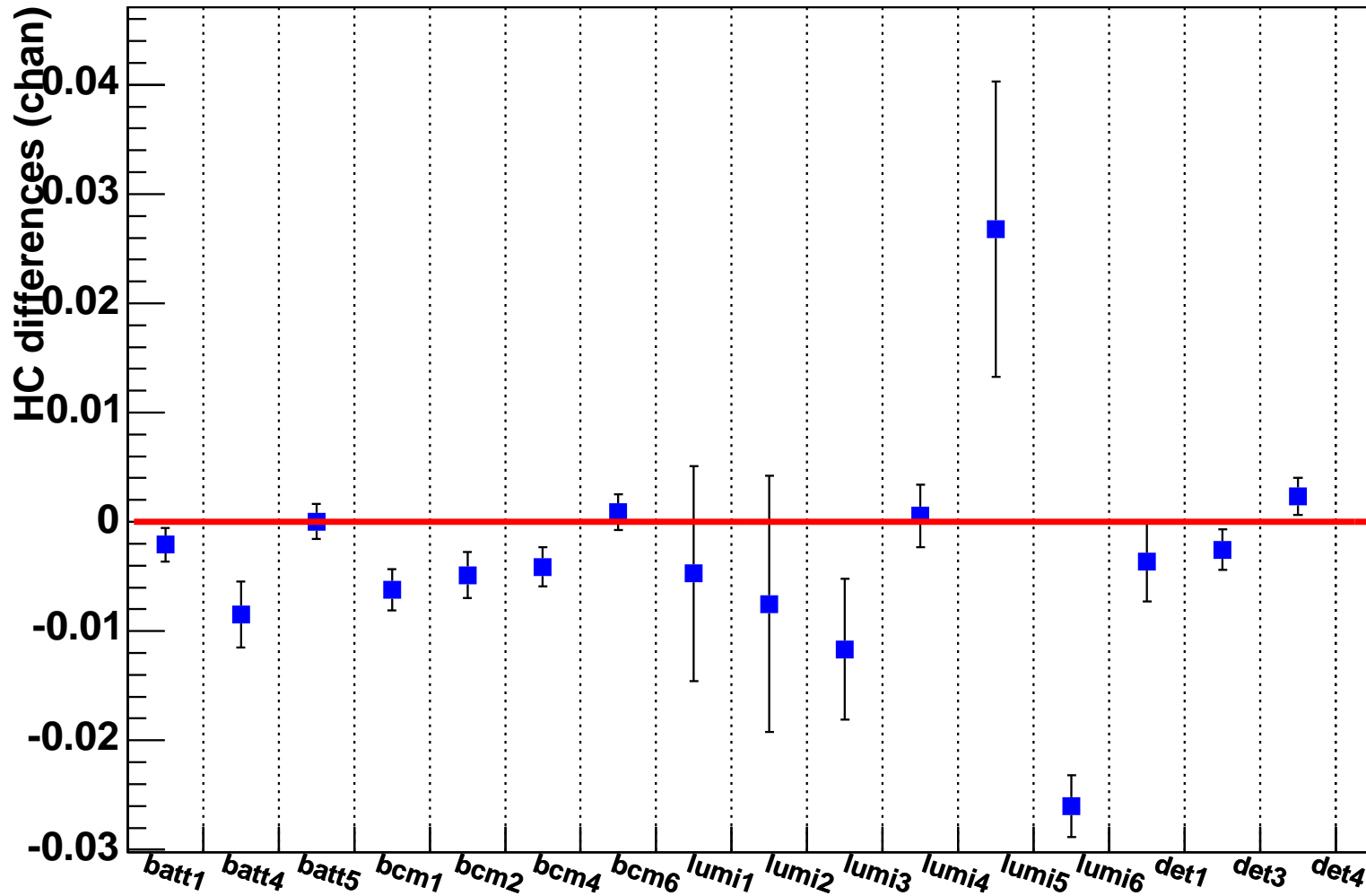
Check for obvious Electronics Pickup

Monitors: BCMs, Batteries, Lumis,
Detectors, Open ADC Channels

Time: 14-16 hours/run

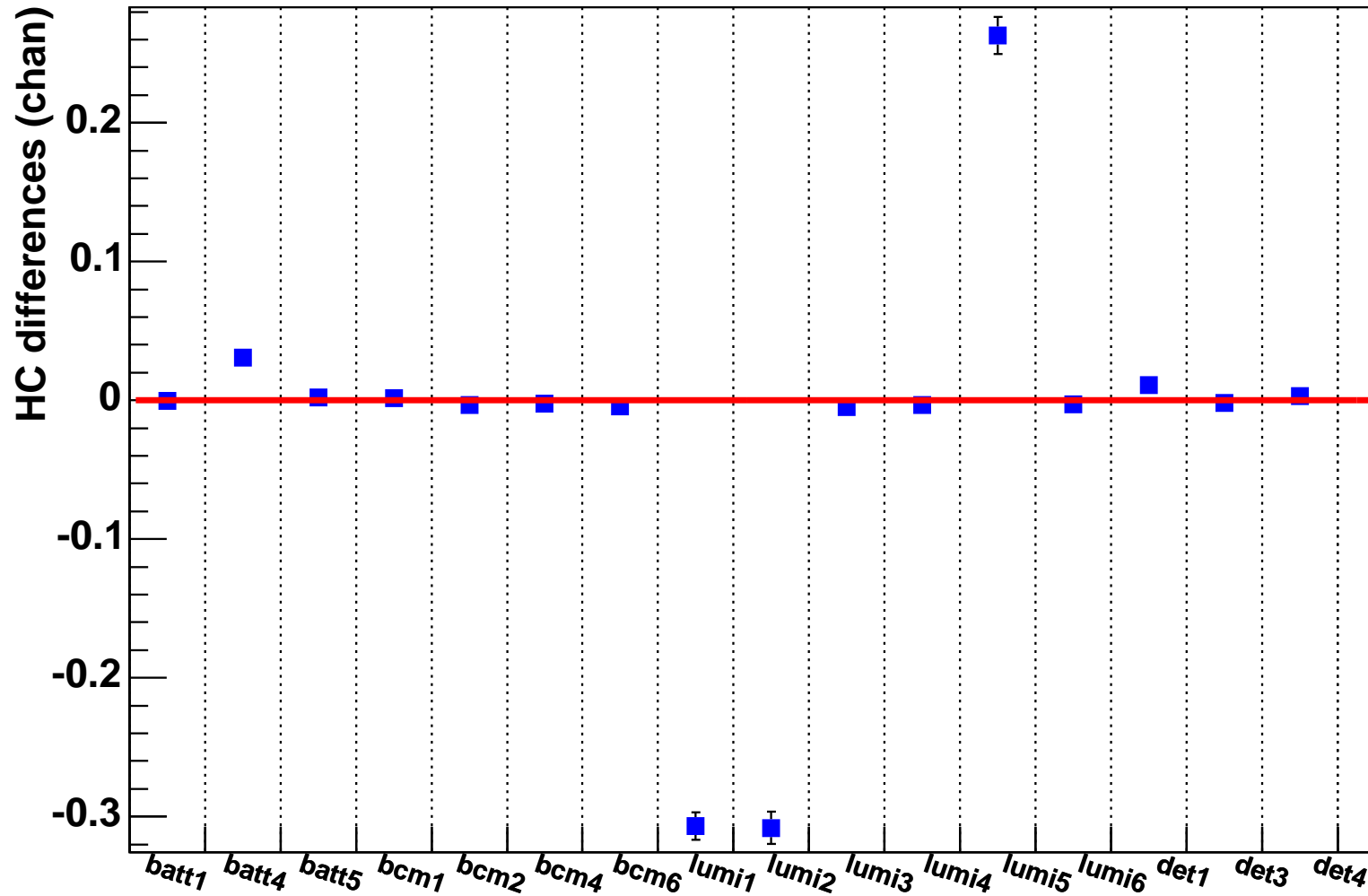
January 2004 Runs

Summary of Run 4217 - Delayed Helicity



January 2004 Runs

Summary of Run 4217 - Delayed Helicity(In-Time Analyzed)



Some conclusions..

Conclusion:

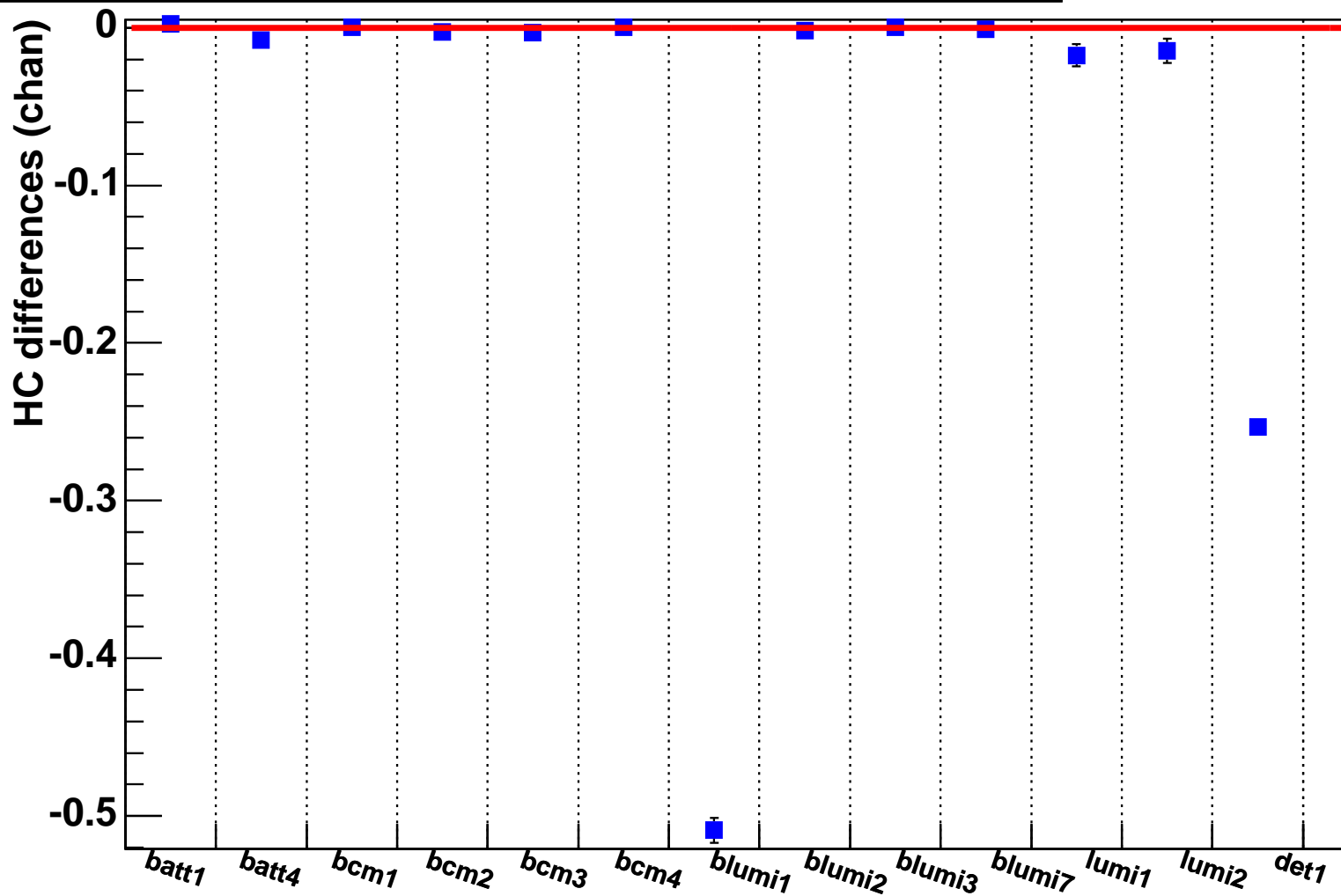
- Electronics Pickup in Current Integrating Channels from Readout Helicity (PS, QRT, delayed HEL).

Solutions:

- Track down ground loops
- Remove all helicity signals from crates

Recent runs..

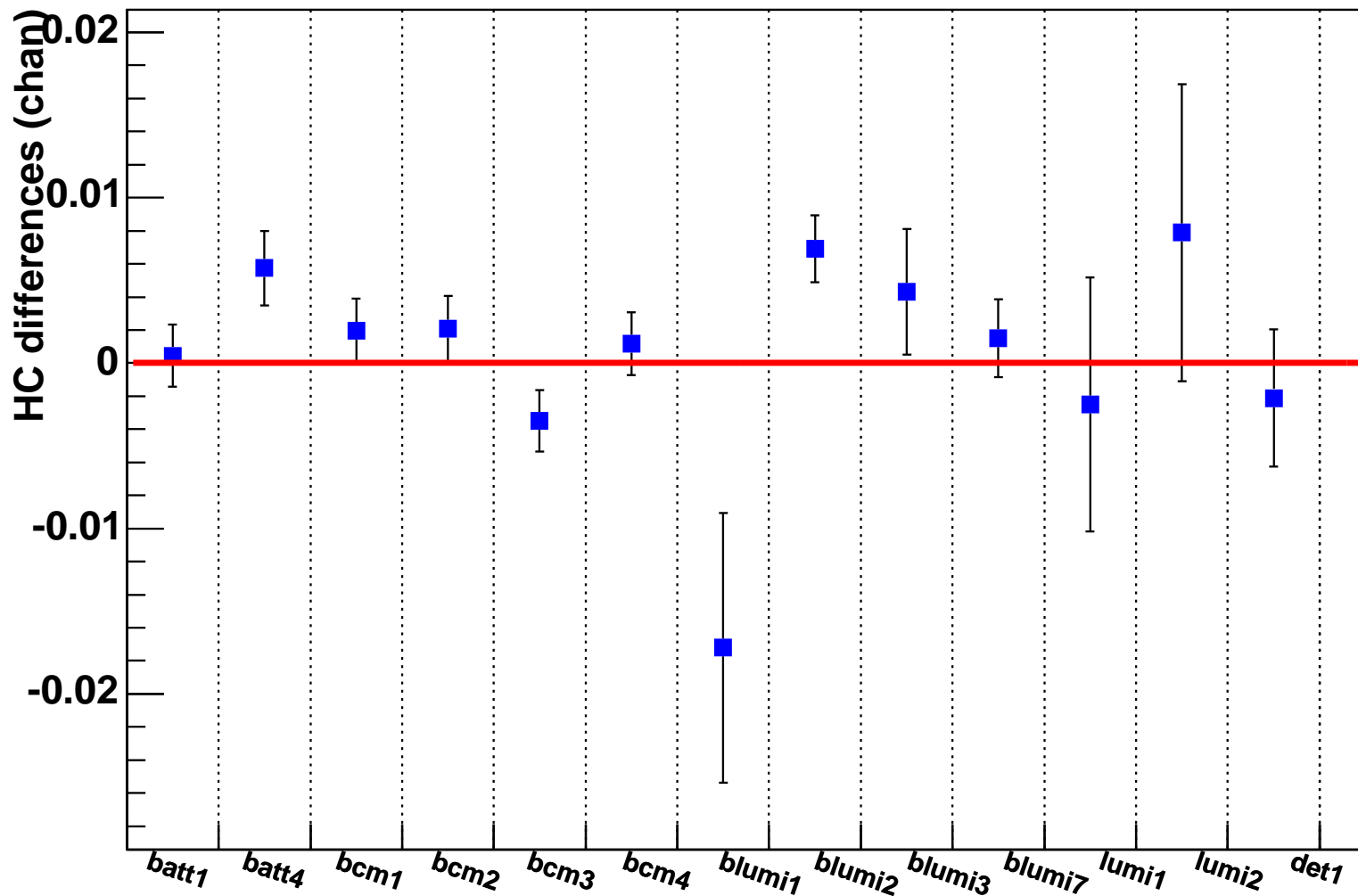
Summary of Run 1061 - Delayed Helicity



Recent runs..

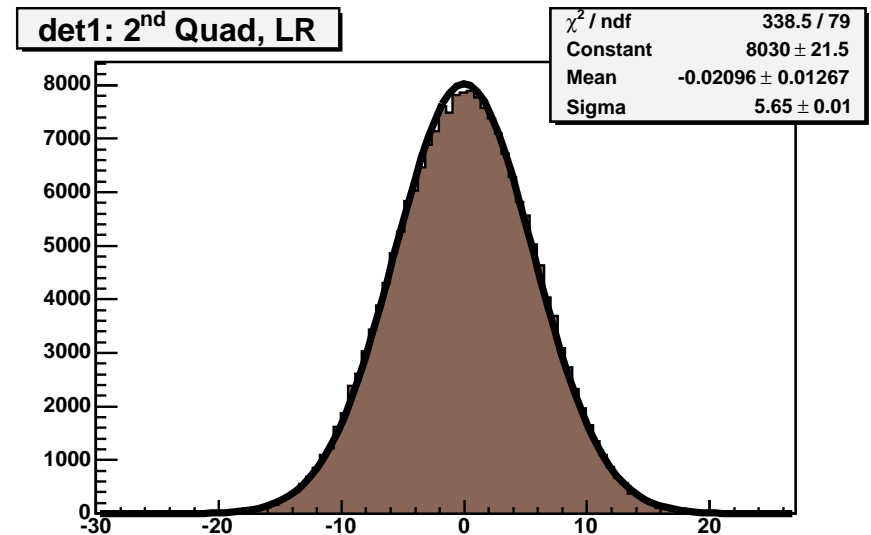
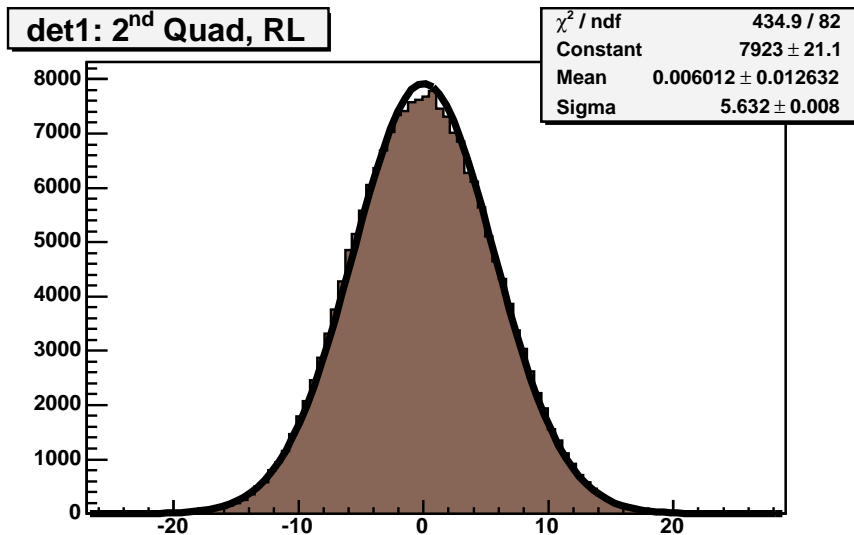
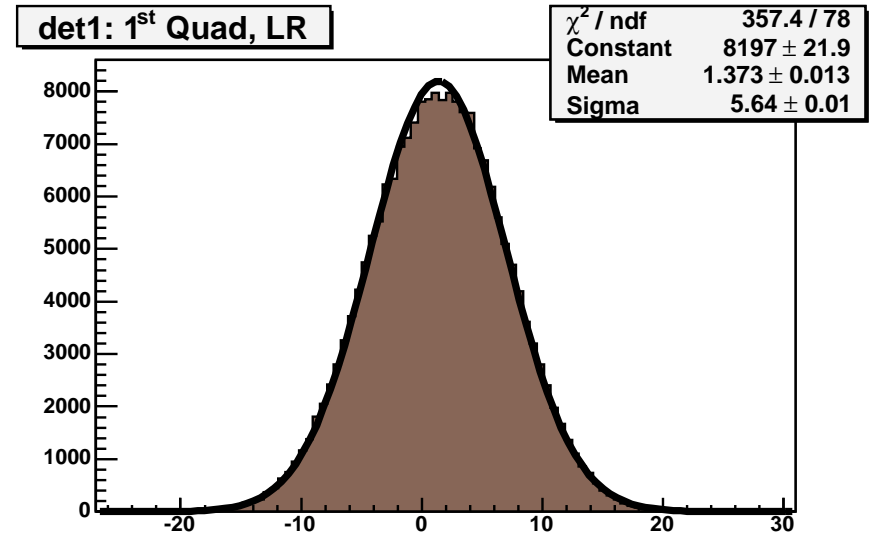
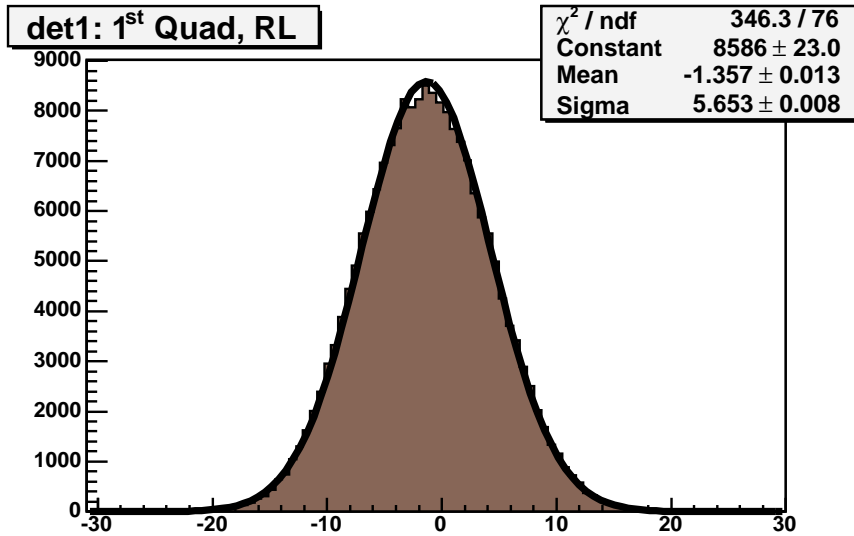
After removing "PairSynch"

Summary of Run 1073 - Delayed Helicity

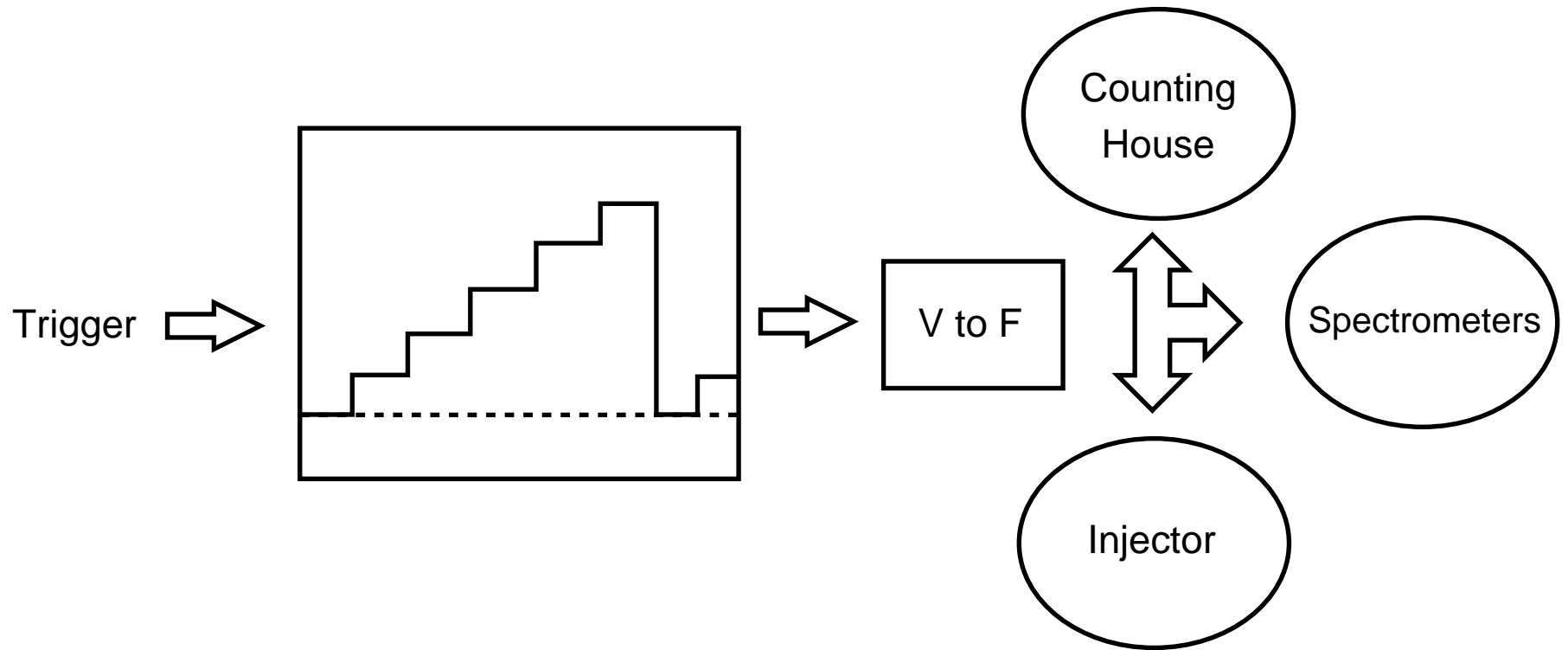


Recent runs..

After removing “PairSynch” and “Helicity”



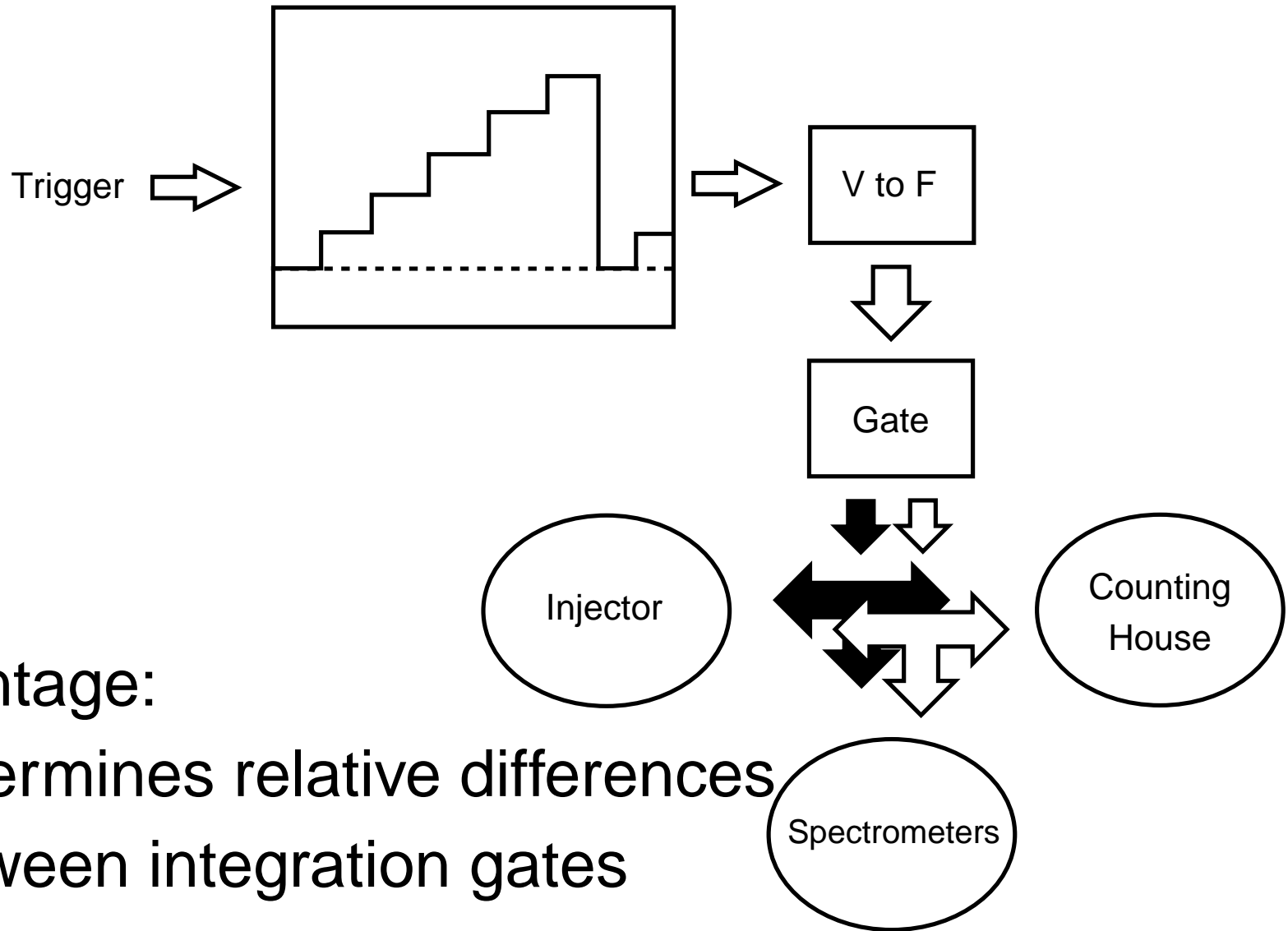
Synchronization Solution #1



Advantages:

- ★ Modules and cables available
- ★ Could be completed very soon

Synchronization Solution #2



Advantage:

- ★ Determines relative differences between integration gates