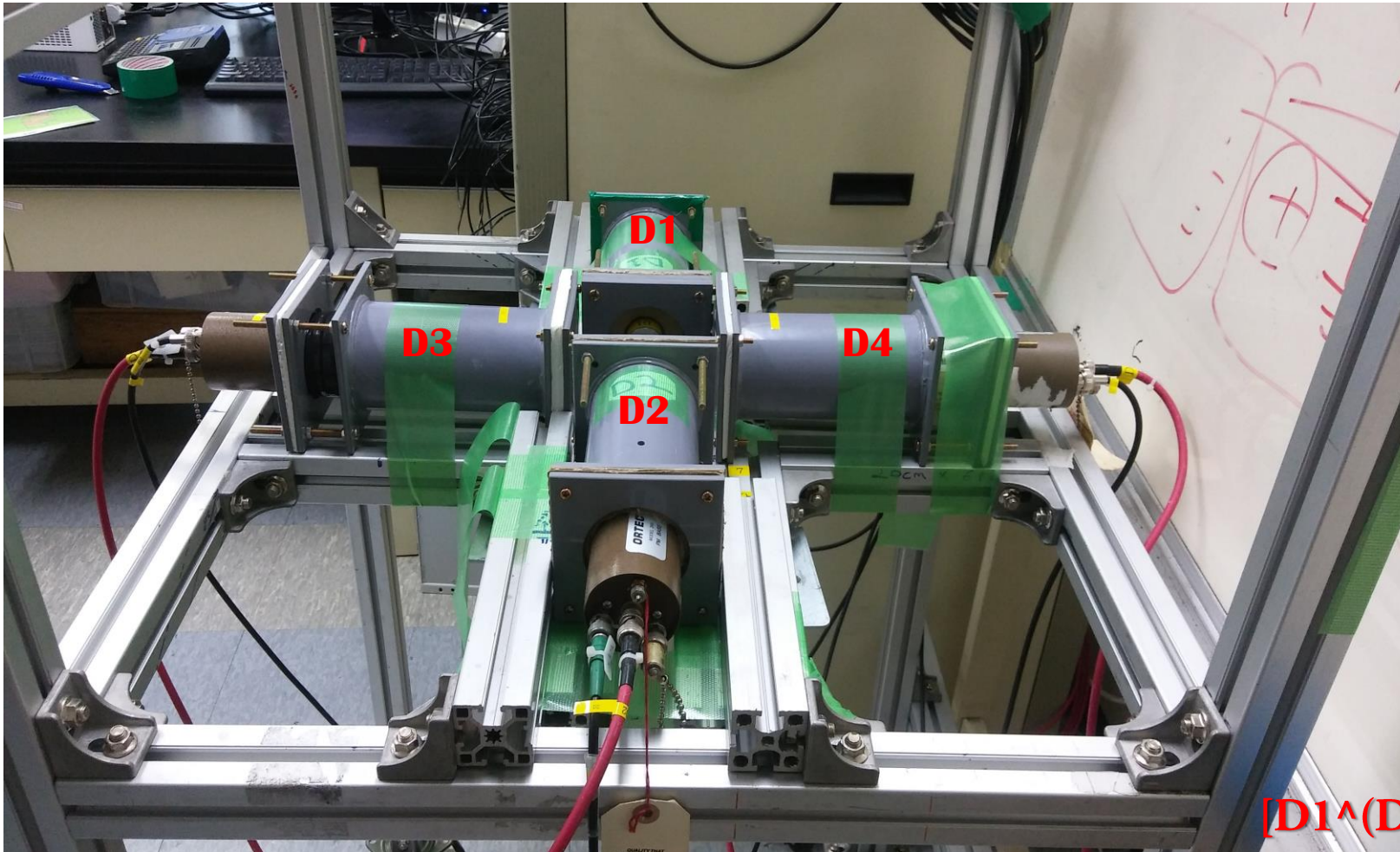


# **Time Measurement System with 4 Detectors**

I.J Lugendo, Lab Meeting, 29/09/2016

# Detector Geometry and Trigger Condition



**D1** is “1x1” LaBr<sub>3</sub>

**D2** is “1.5x1.5” LaBr<sub>3</sub>

**D3** is “2x2” NaI(Tl)

**D4** is “2x2” NaI(Tl)

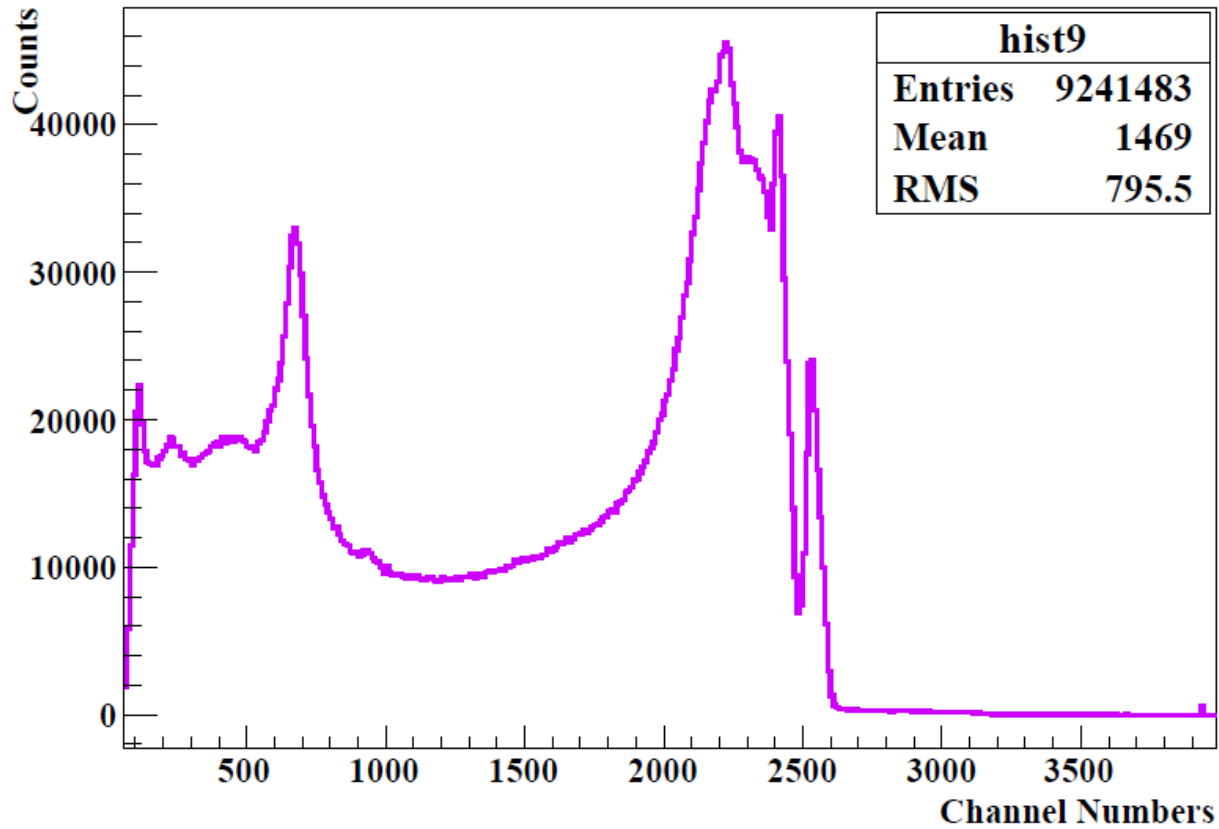
- D1 and D2 are 6 cm apart
- D3 and D4 are 10 cm apart

Trigger is set to be;

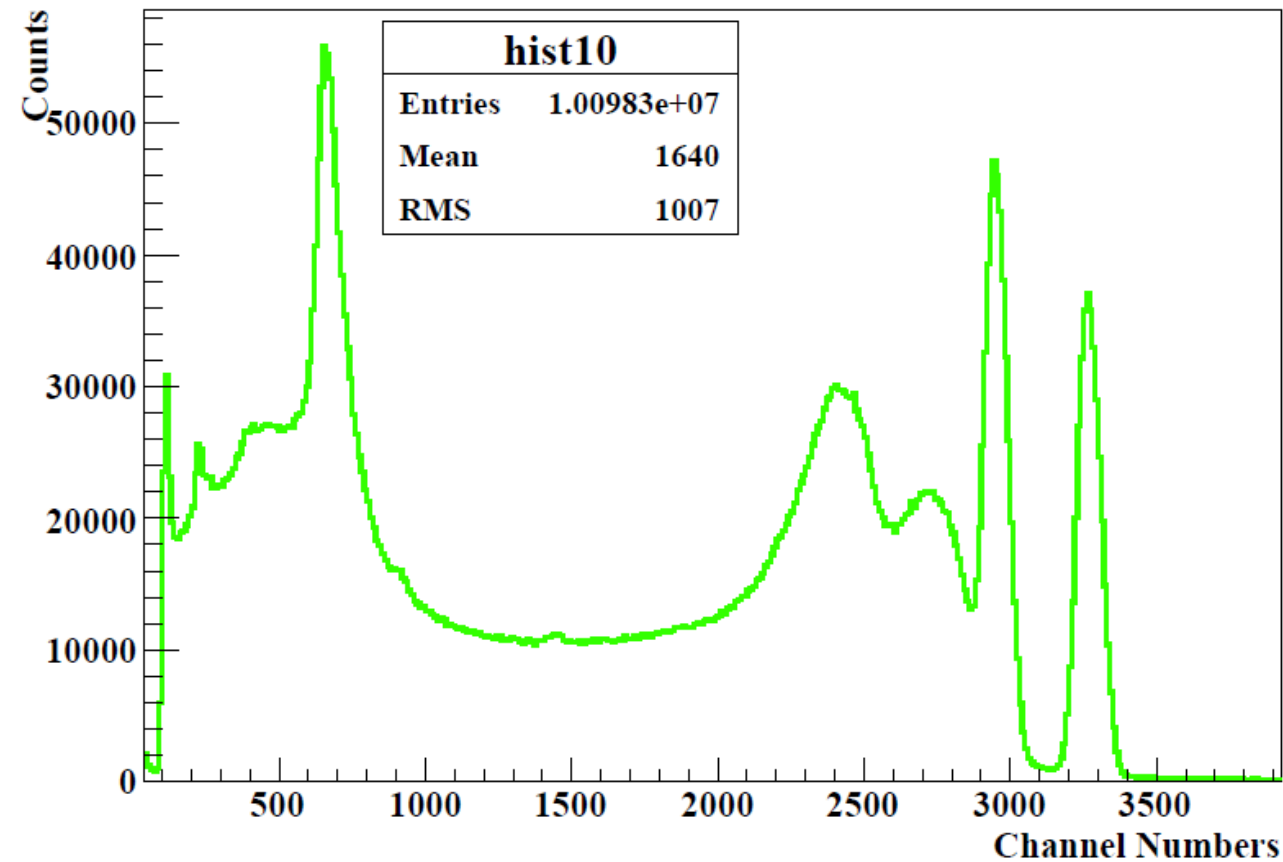
$$[D1 \wedge (D2 \vee D3 \vee D4)] \vee [D2 \wedge (D3 \vee D4)] \vee (D3 \wedge D4)$$

# Co-63 Spectra

## D1 Corrected Spectrum

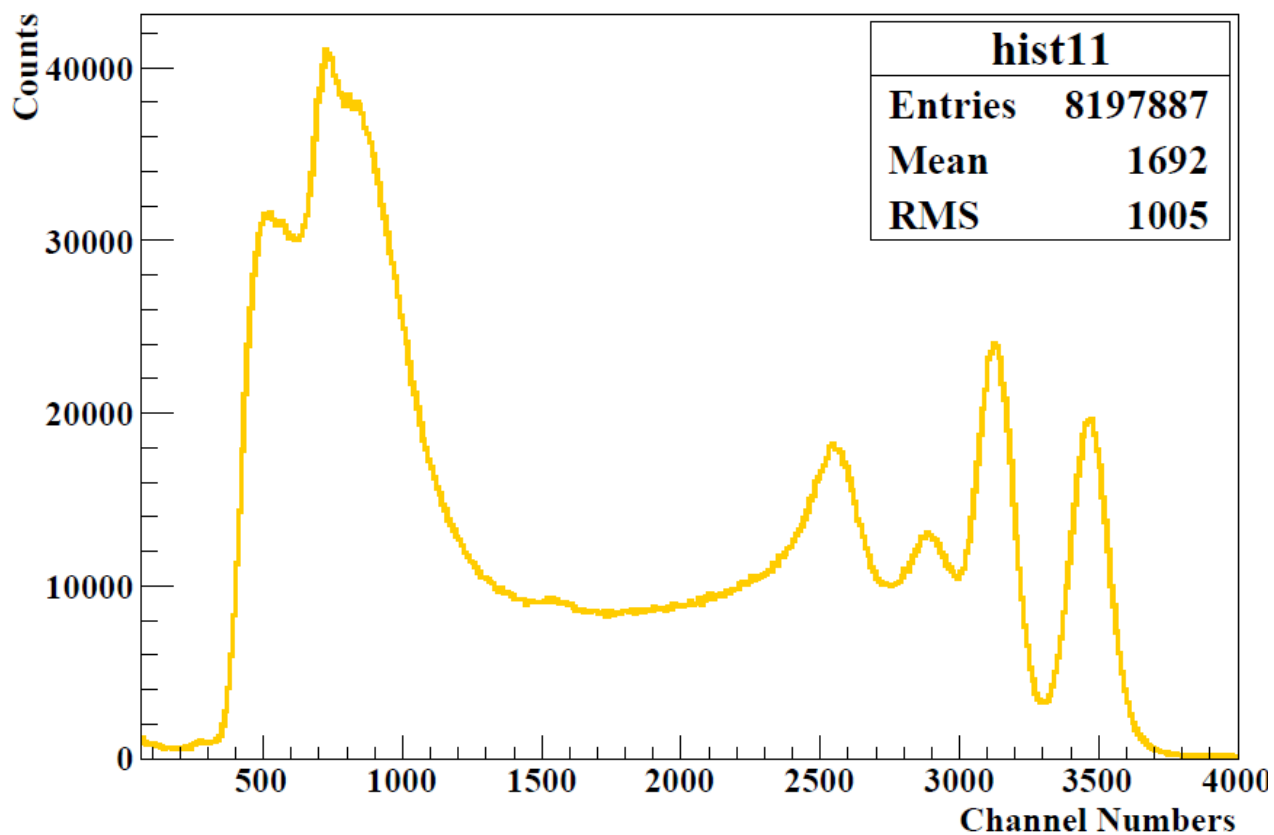


## D2 Corrected Spectrum

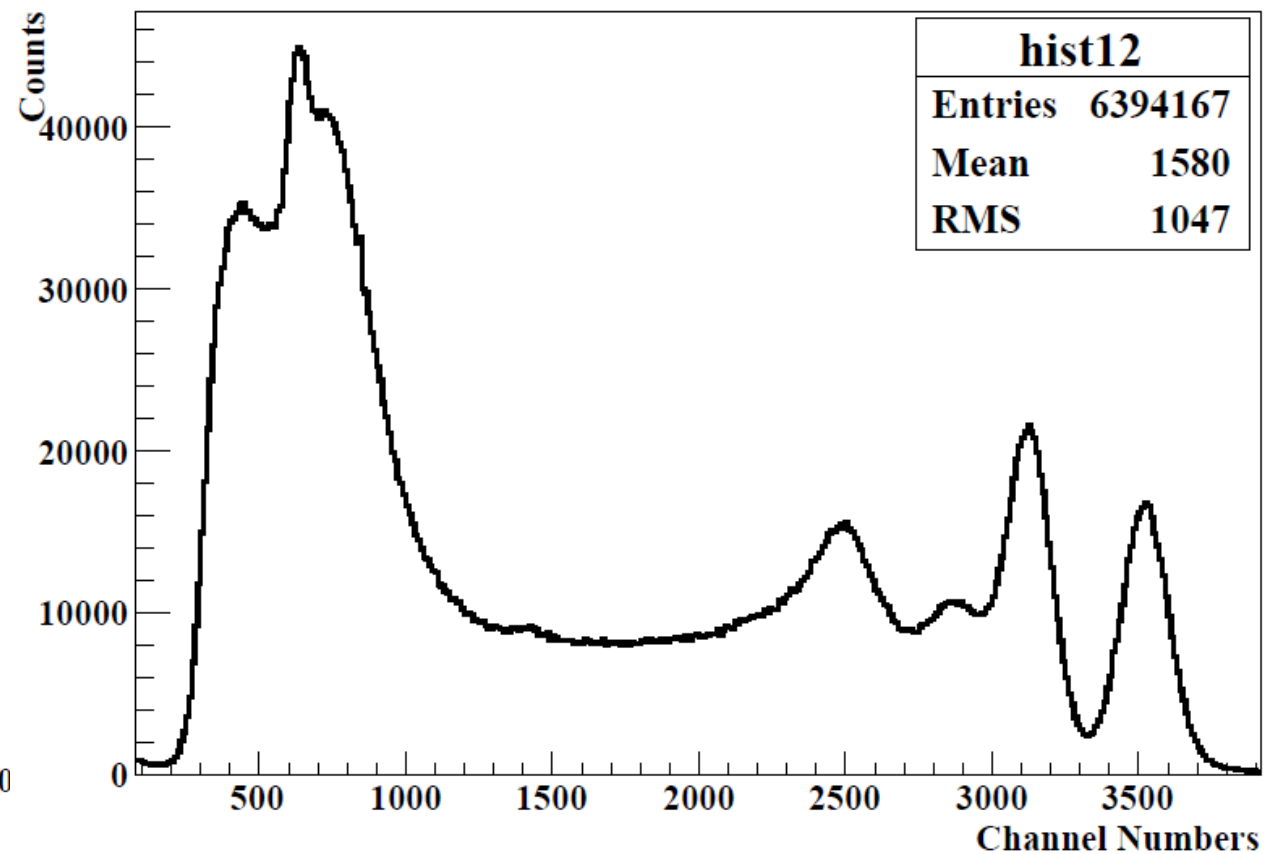


# Co-63 Spectra

D3 Corrected Spectrum

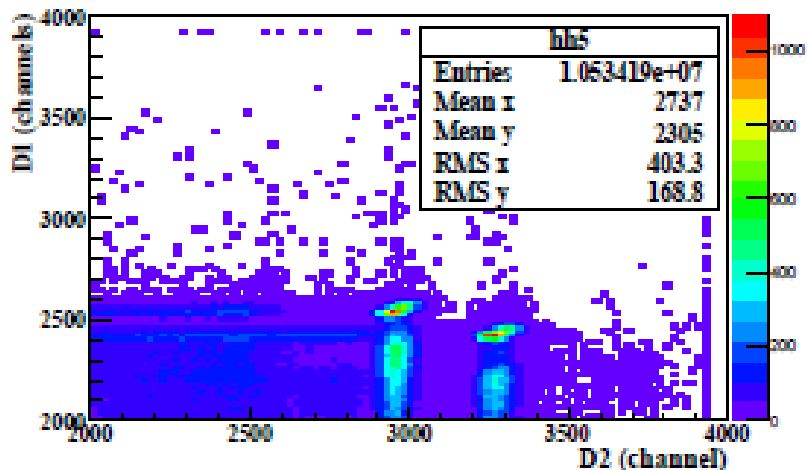


D4 Corrected Spectrum

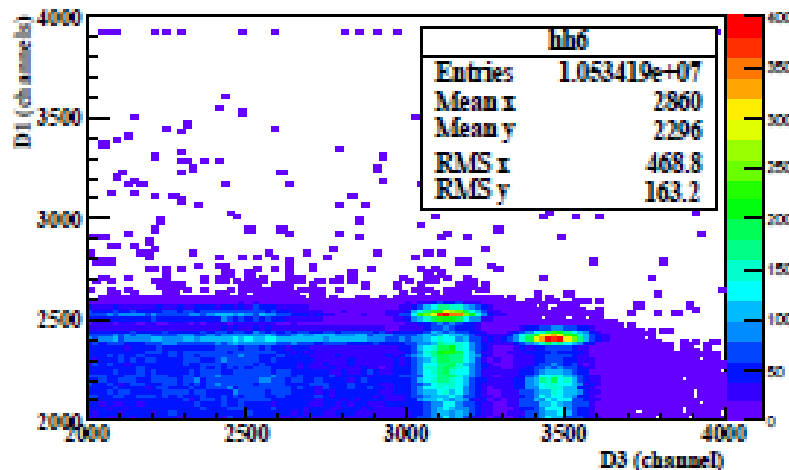


# Observing Coincident Events

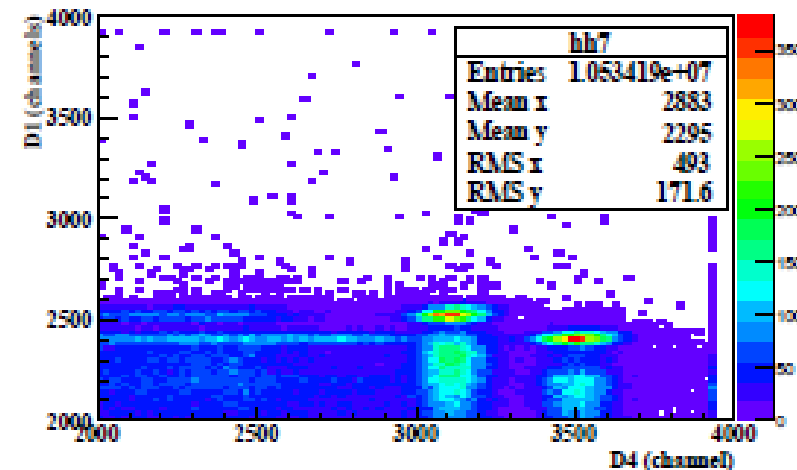
### D1nD2 Correlation



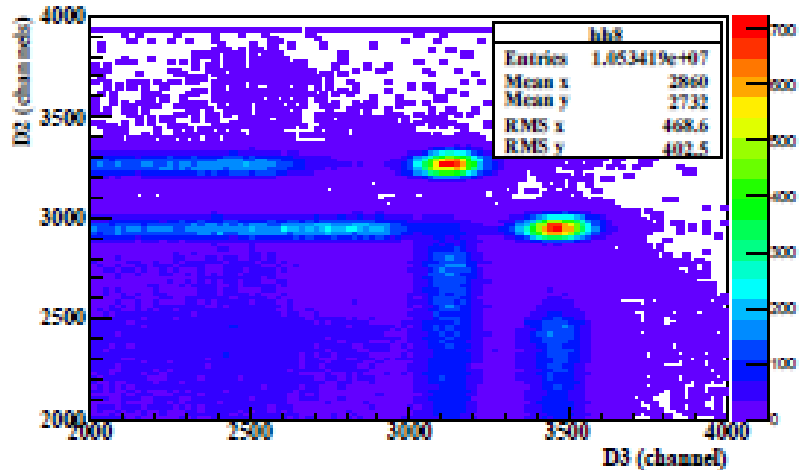
### D1nD3 Correlation



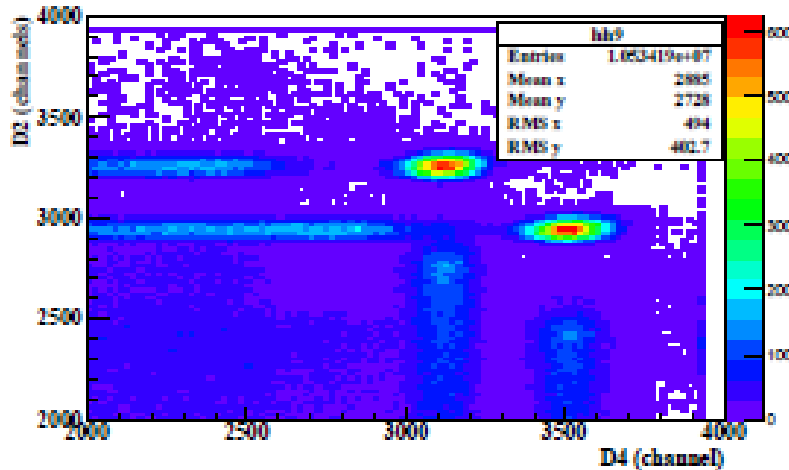
### D1nD4 Correlation



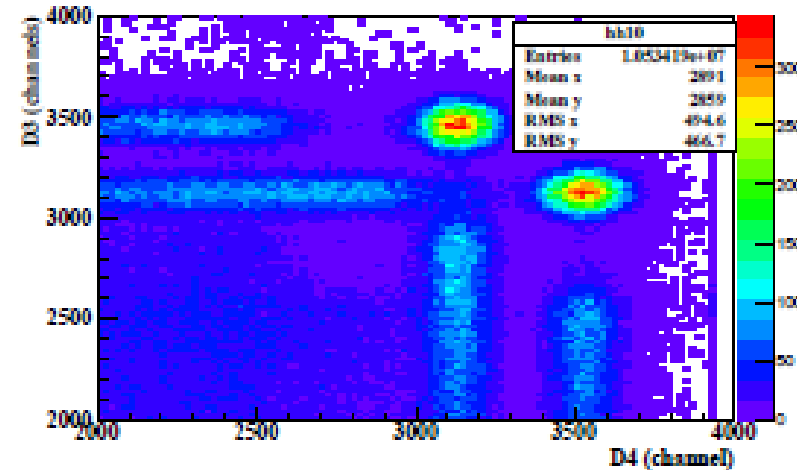
### D2nD3 Correlation



### D2nD4 Correlation

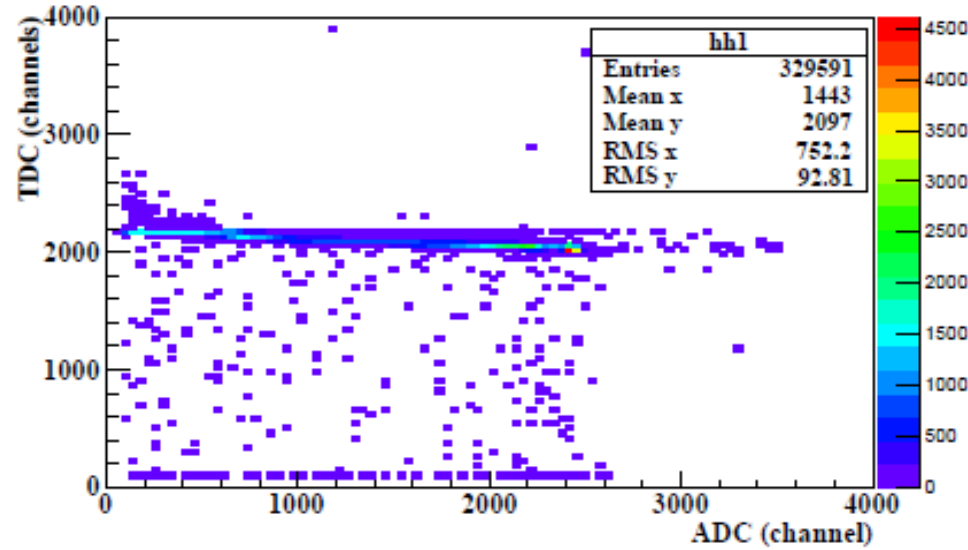


### D3nD4 Correlation

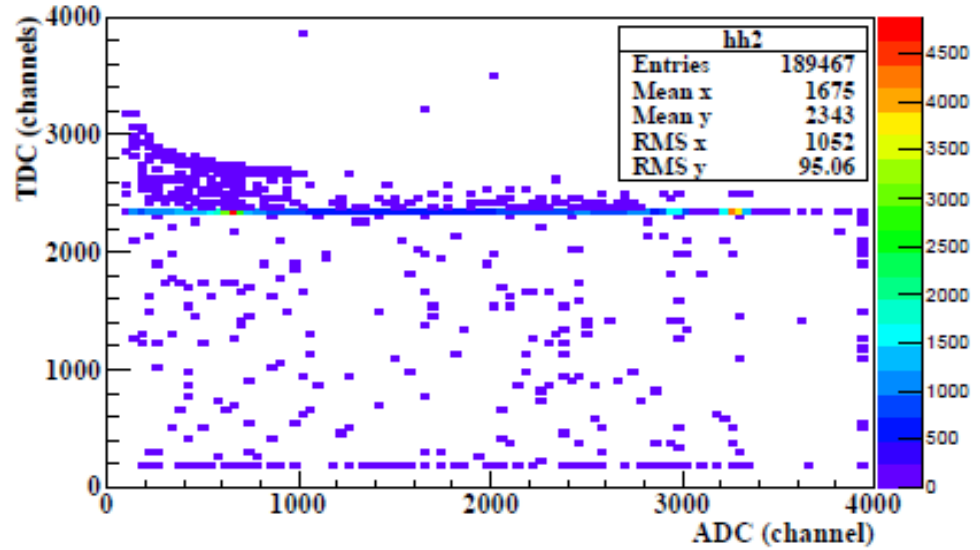


# Time Correlations before Slewing Correction

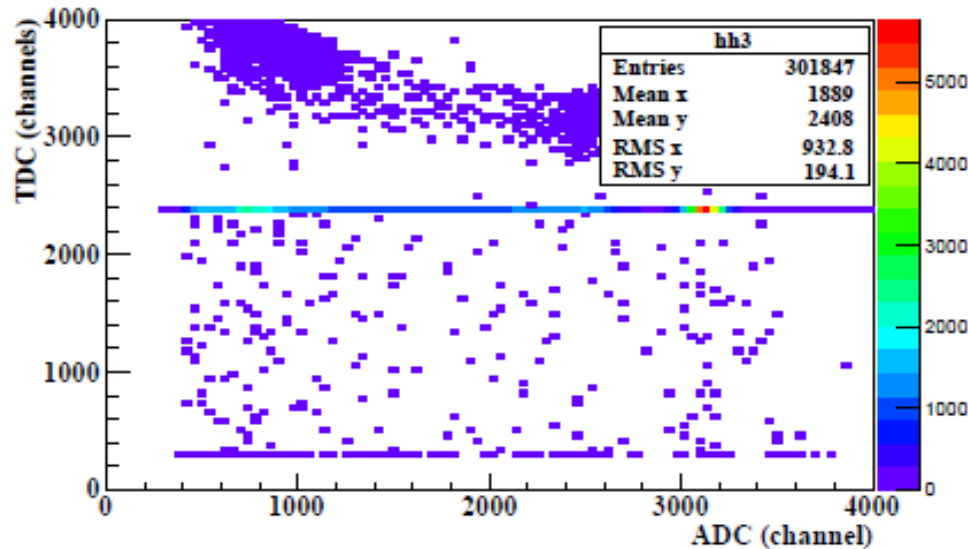
D1 Correlation before slewing Correction



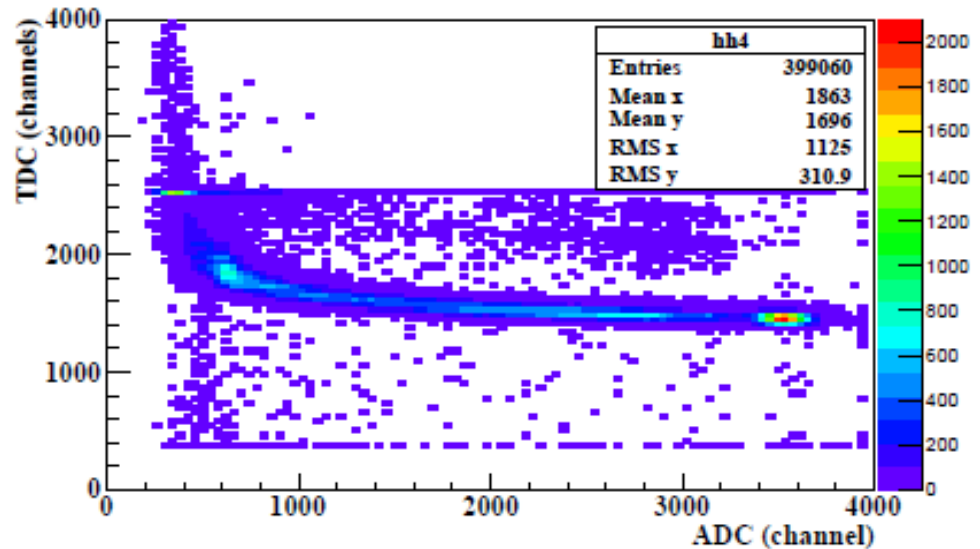
D2 Correlation before slewing Correction



D3 Correlation before slewing Correction

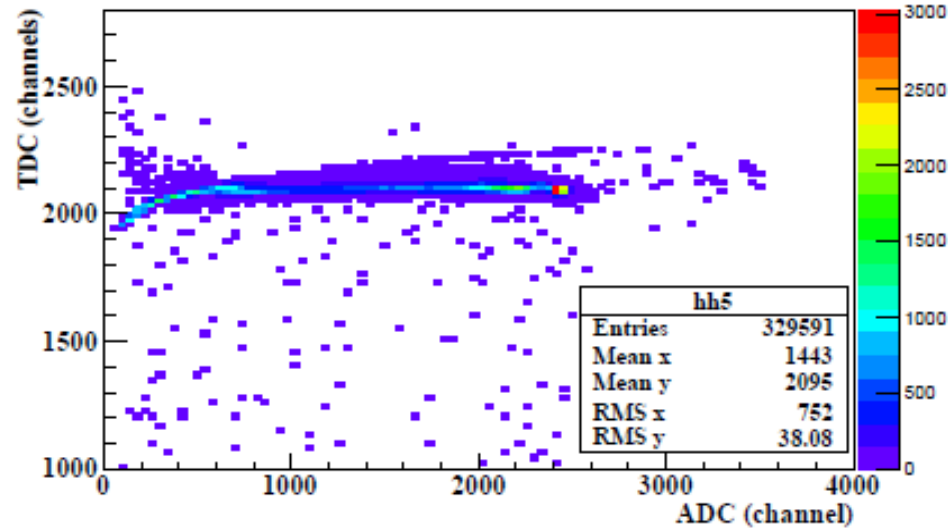


D4 Correlation before slewing Correction

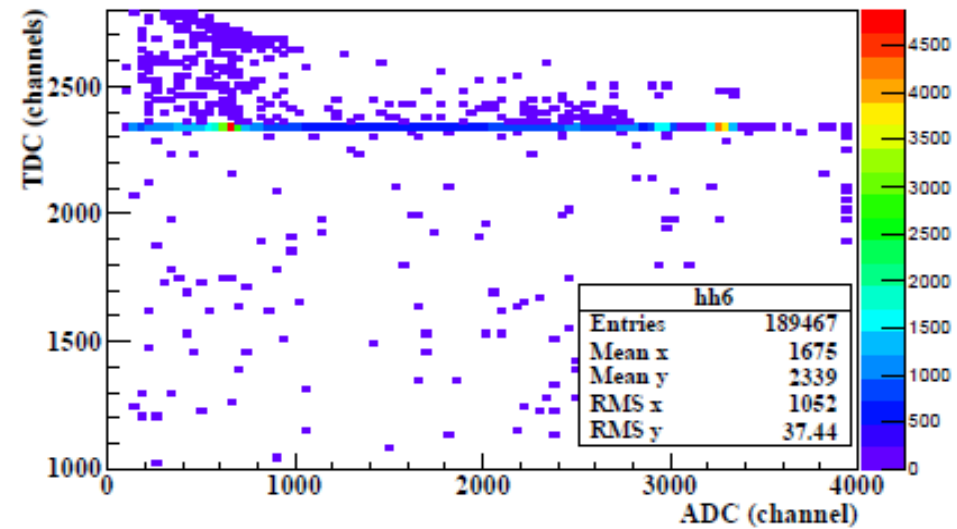


# Time Correlations After Slewing Correction

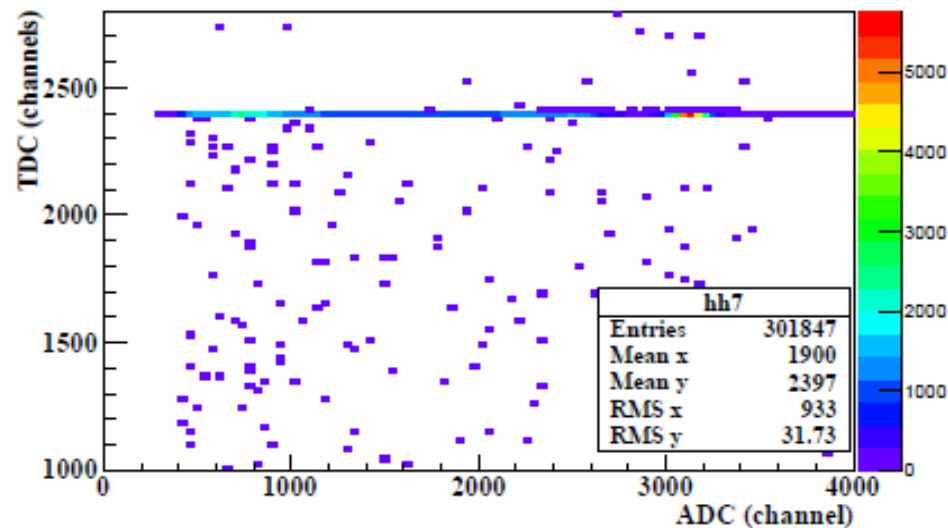
D1 Correlation After Slewing Correction



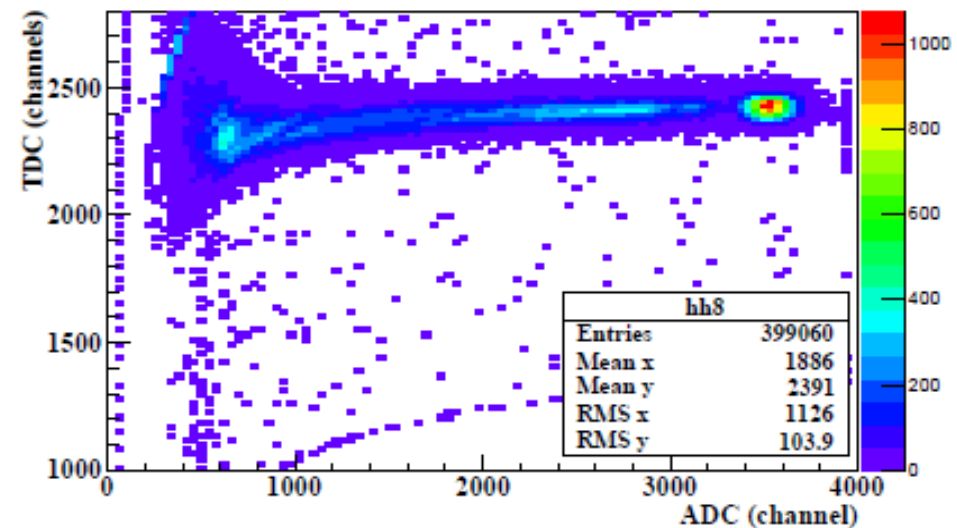
D2 Correlation After Slewing Correction



D3 Correlation After Slewing Correction



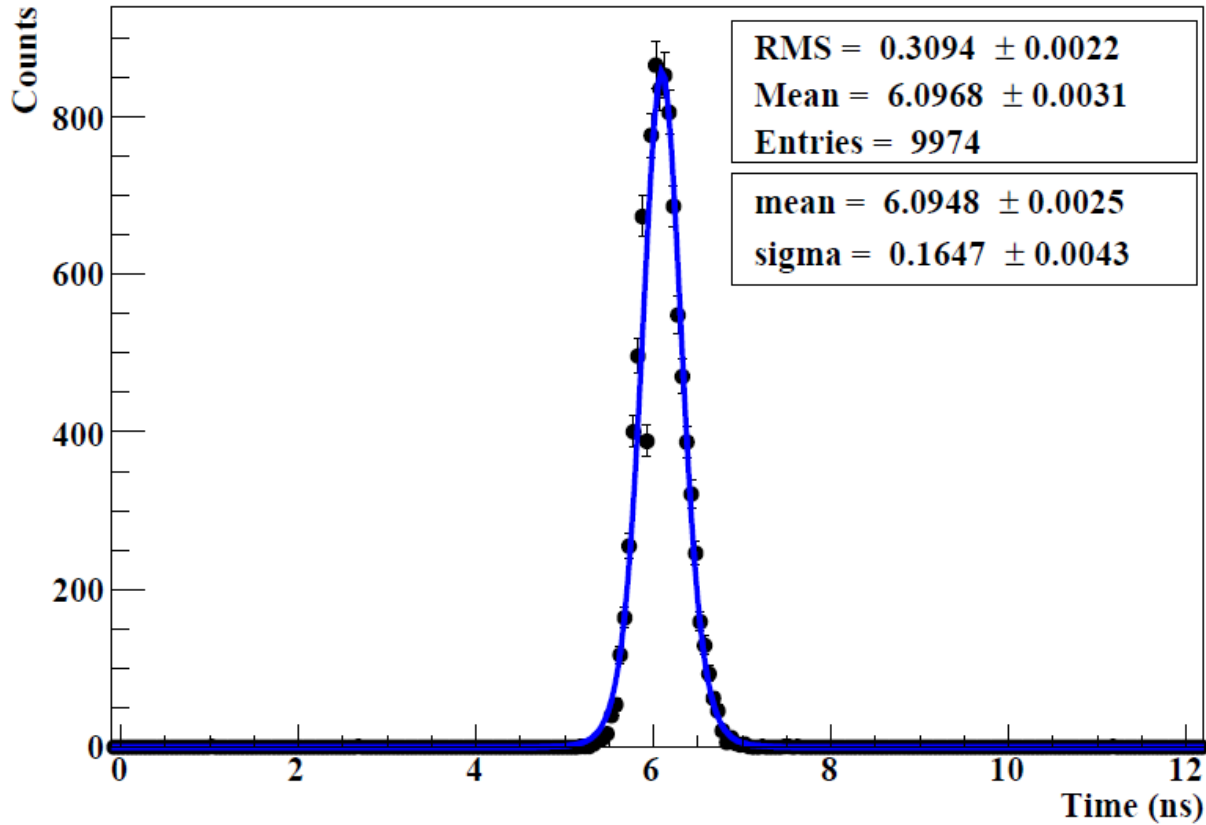
D4 Correlation After Slewing Correction



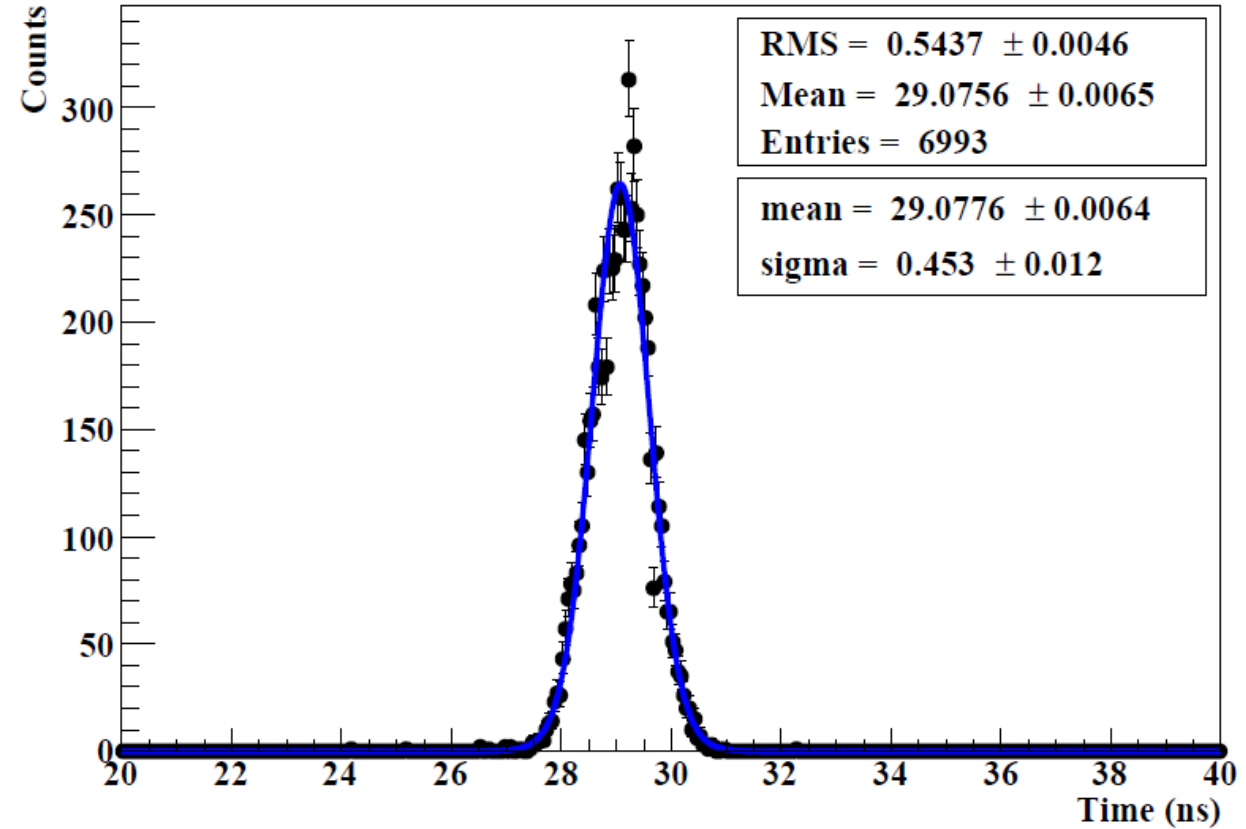


# Time Resolution

Time Resolution for D1nD2



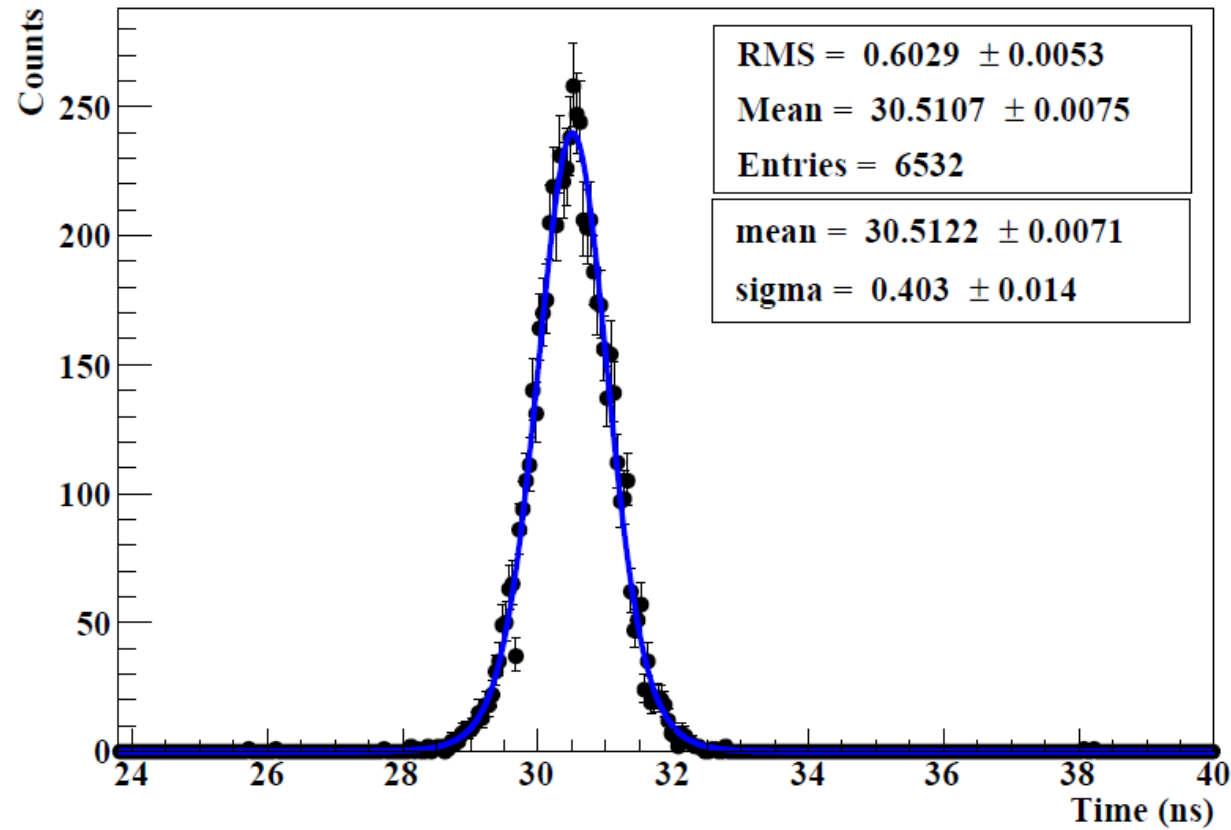
Time Resolution for D1nD3



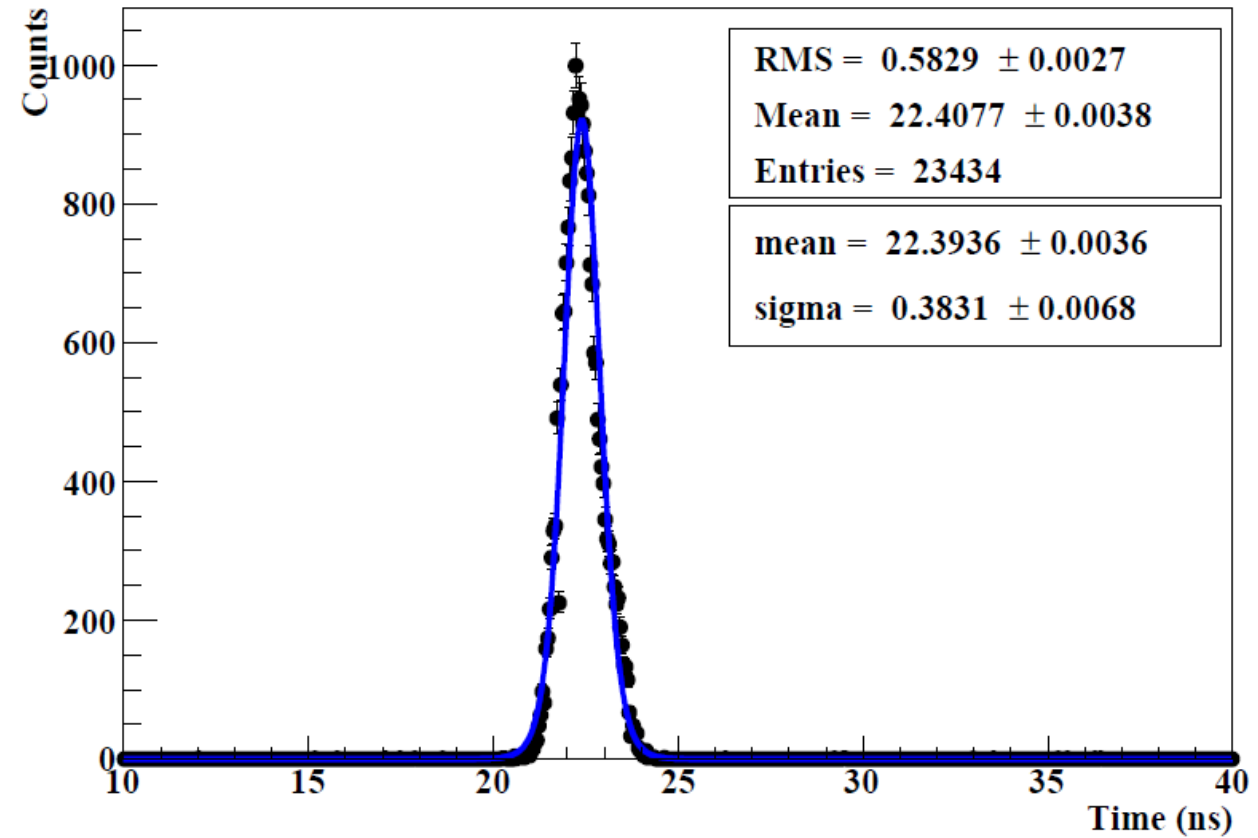


# Time Resolution

Time Resolution for D1nD4

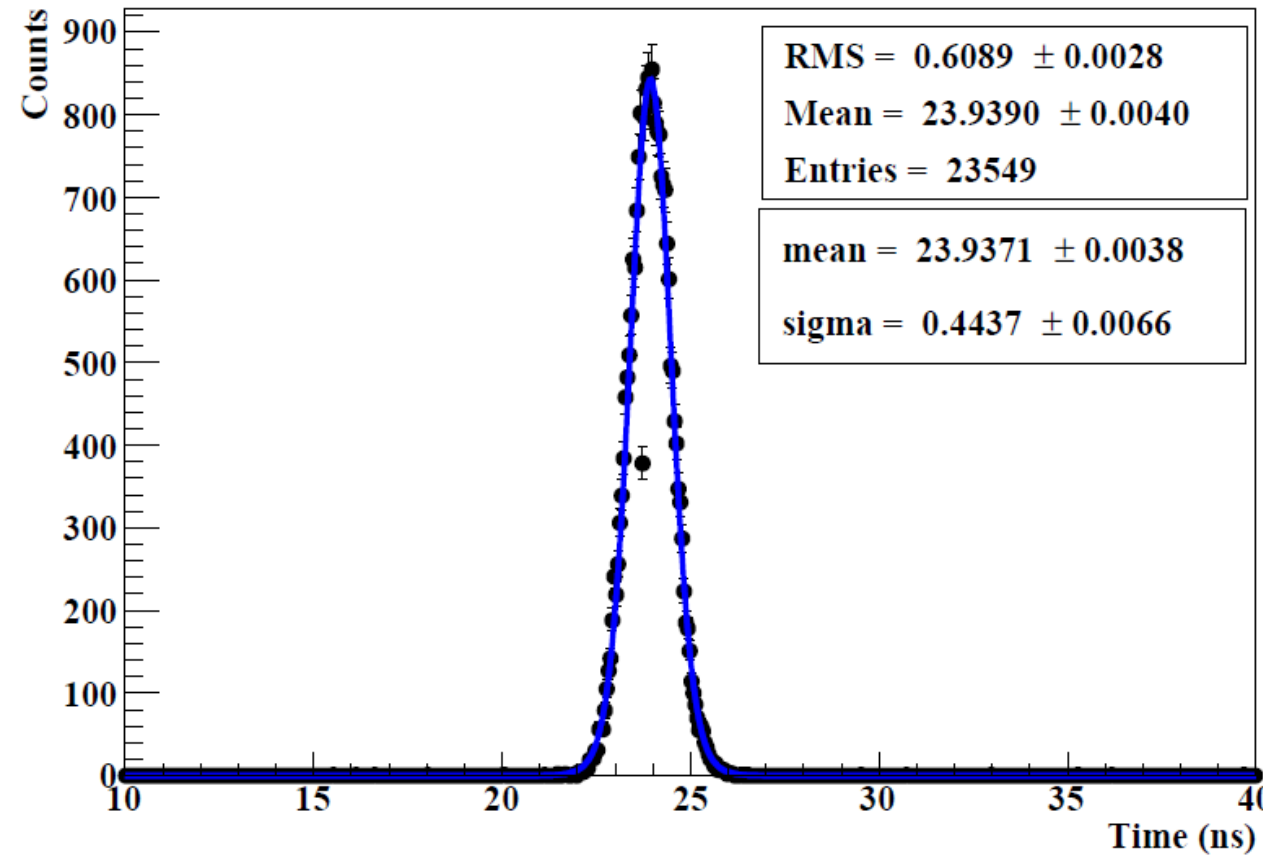


Time Resolution for D2nD3

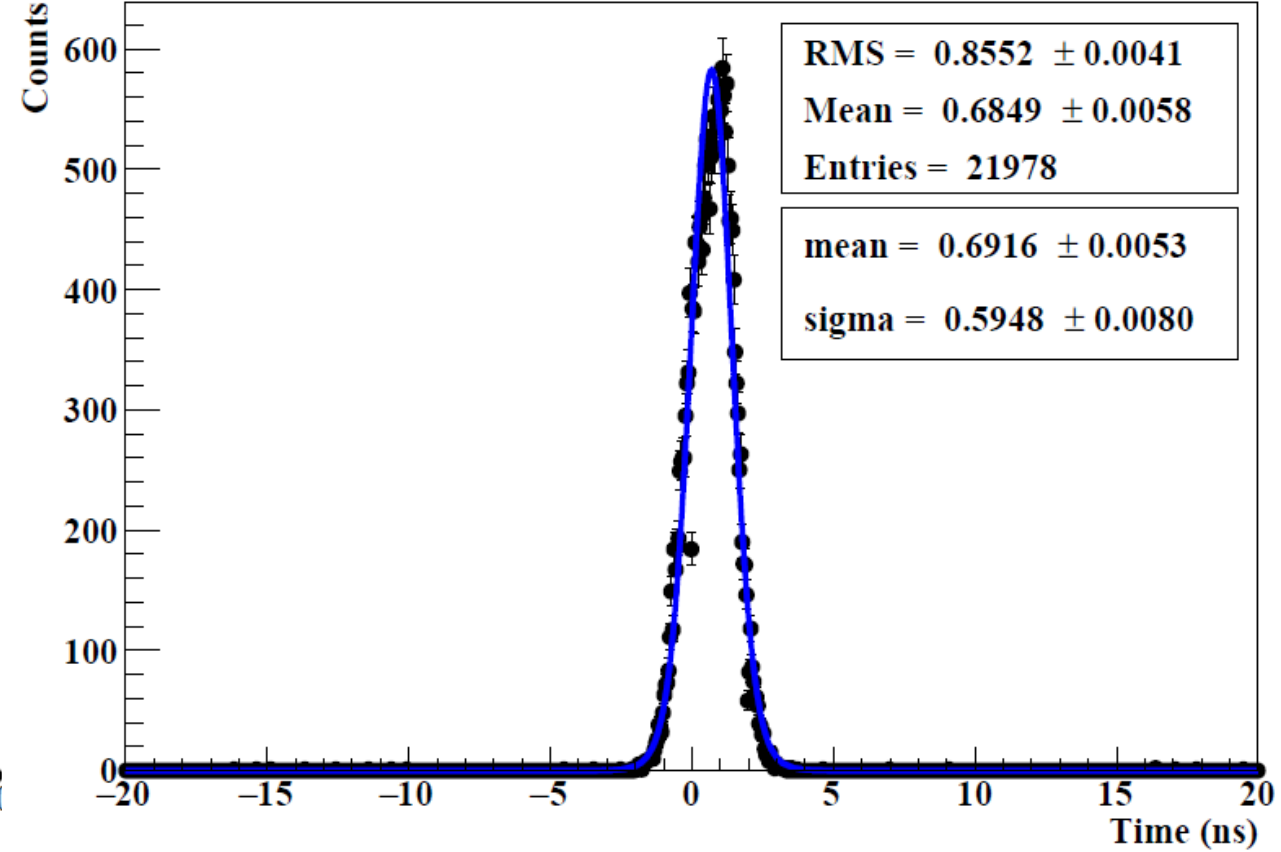


# Time Resolution

Time Resolution for D2nD4



Time Resolution for D3nD4

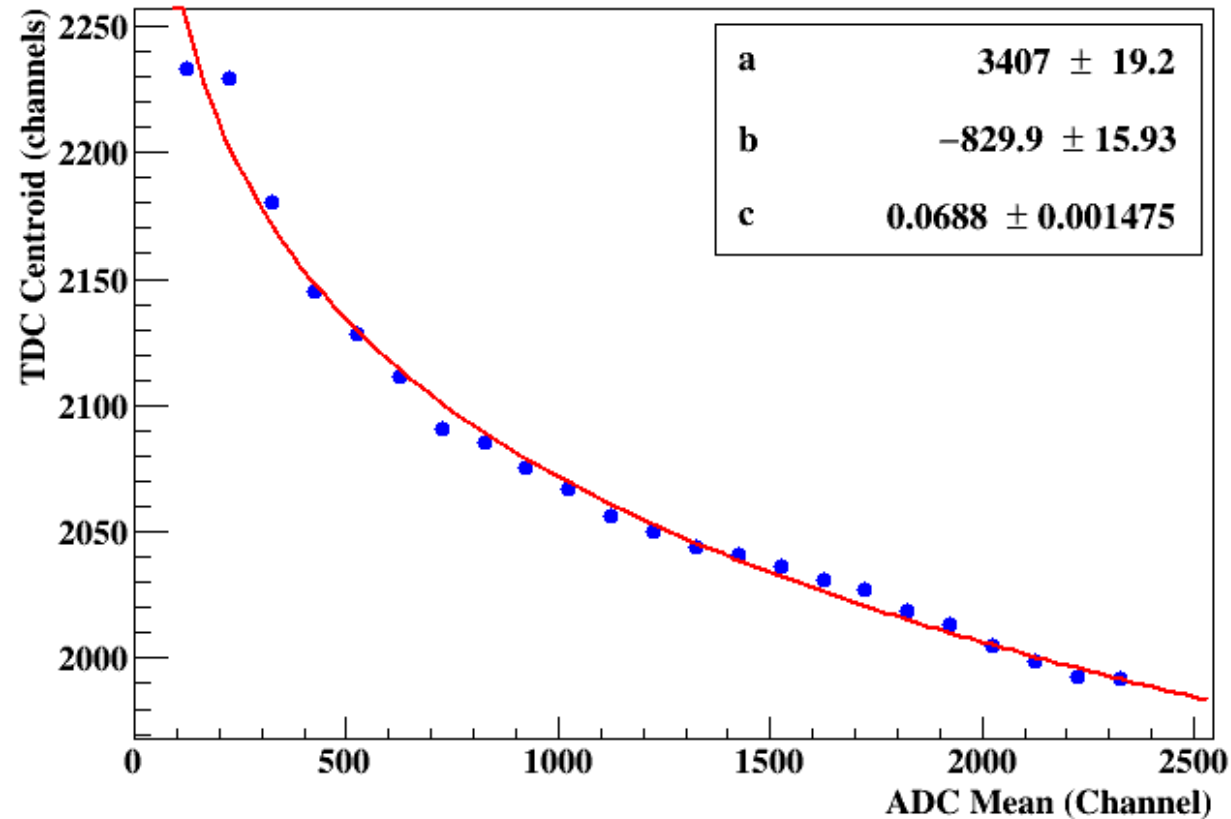


THANK YOU! JAH BLESS!!

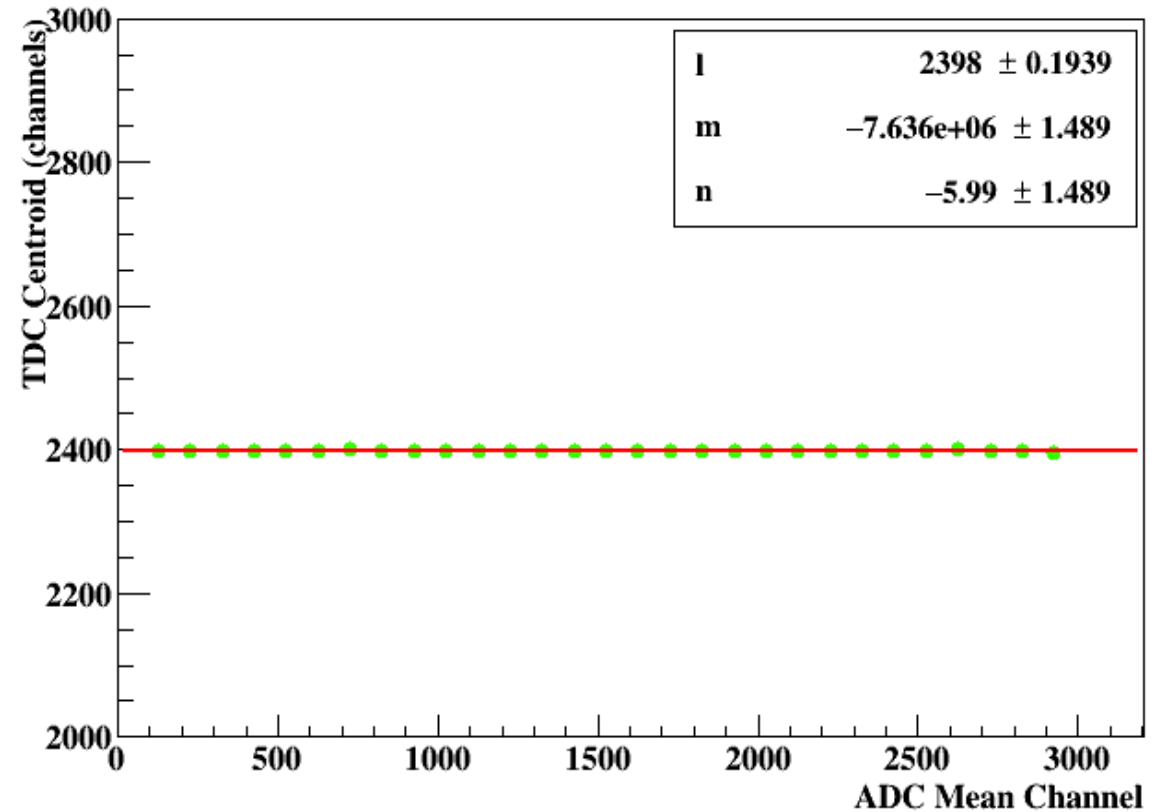


# Backup 1

## Slewing Correction Function for D1



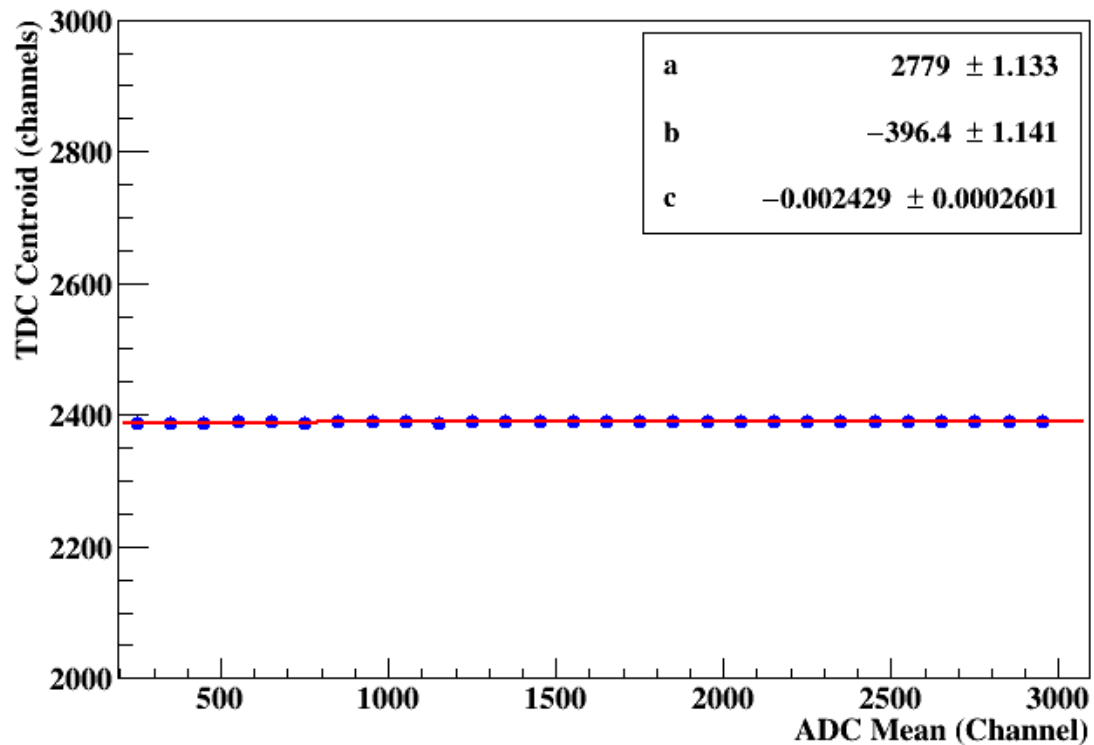
## Slewing Correction Function for D2



$$\tau = p0 + p1 \times [(ADC)^{p3}]$$

# Backup2

### Slewing Correction Function for D3



### Slewing Correction Function for D4

