MIPs calibration

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UofR Group
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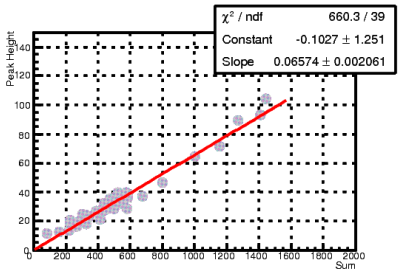
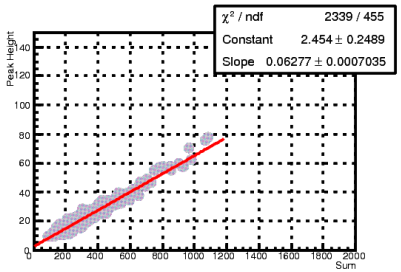
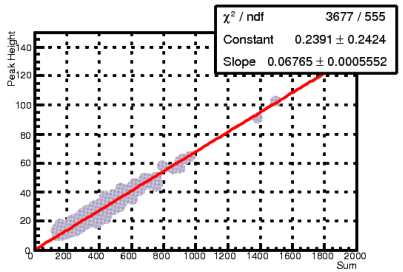
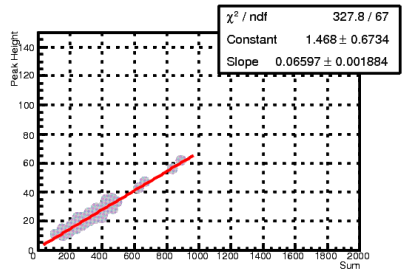
Starting Slide 12

Peak vs Sum Plot (2404 Upstream)



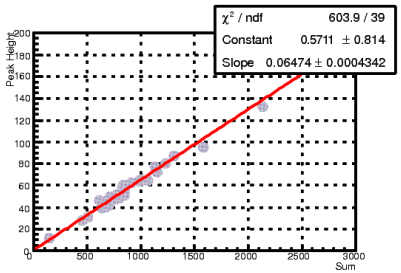


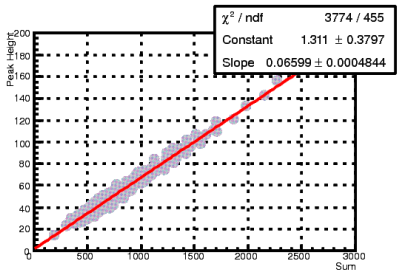


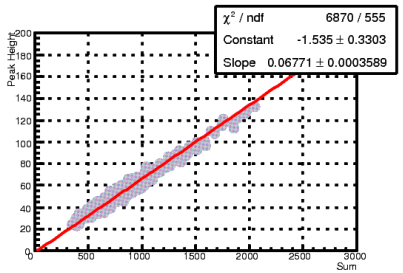


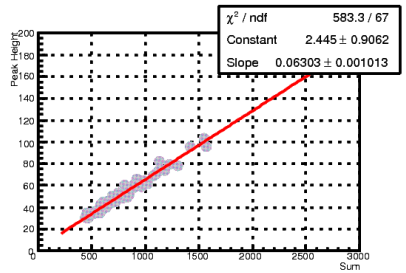
X: 120

Y: 2000



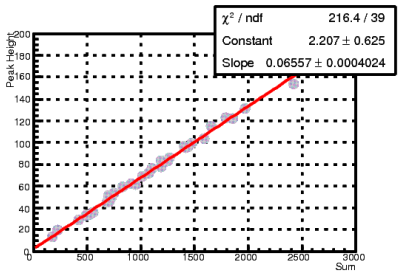


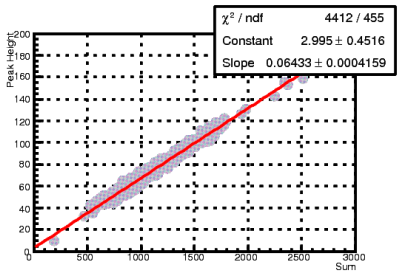


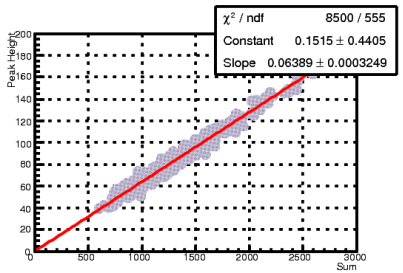


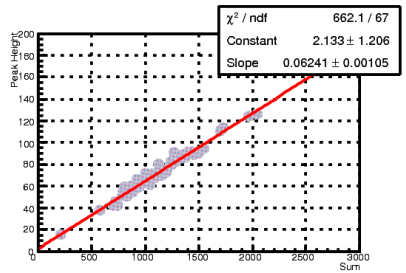
X: 200

Y: 3000



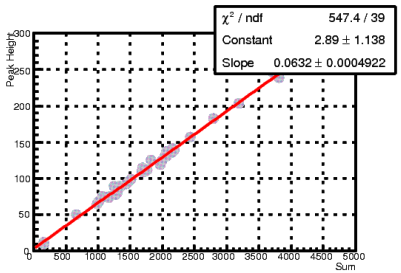


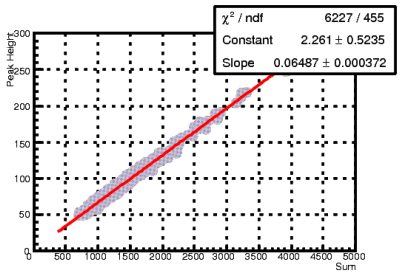


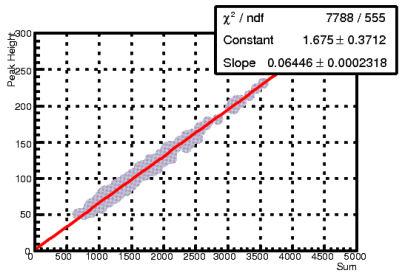


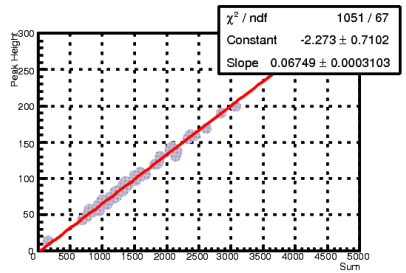
X: 200

Y: 3000





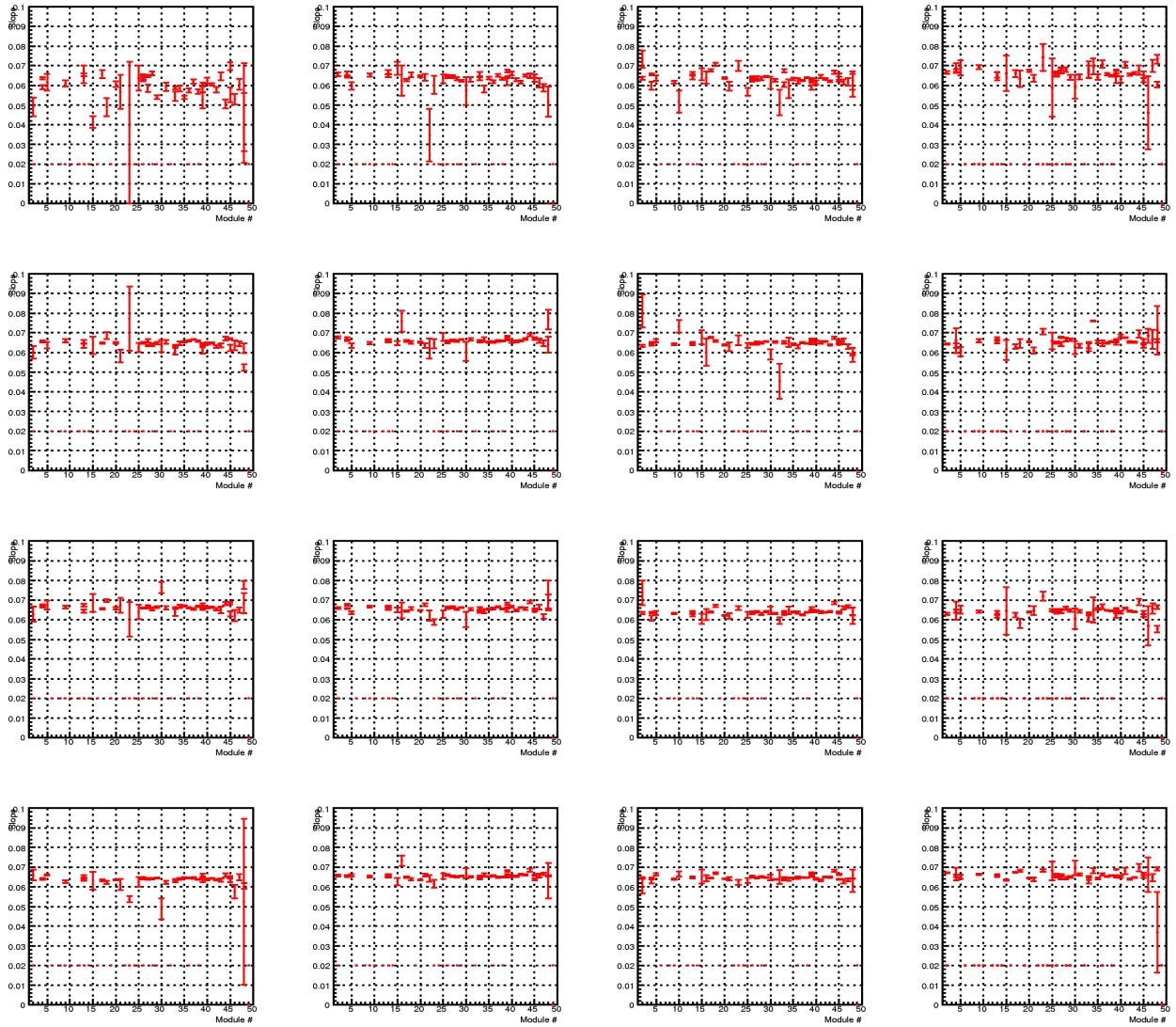




X: 300

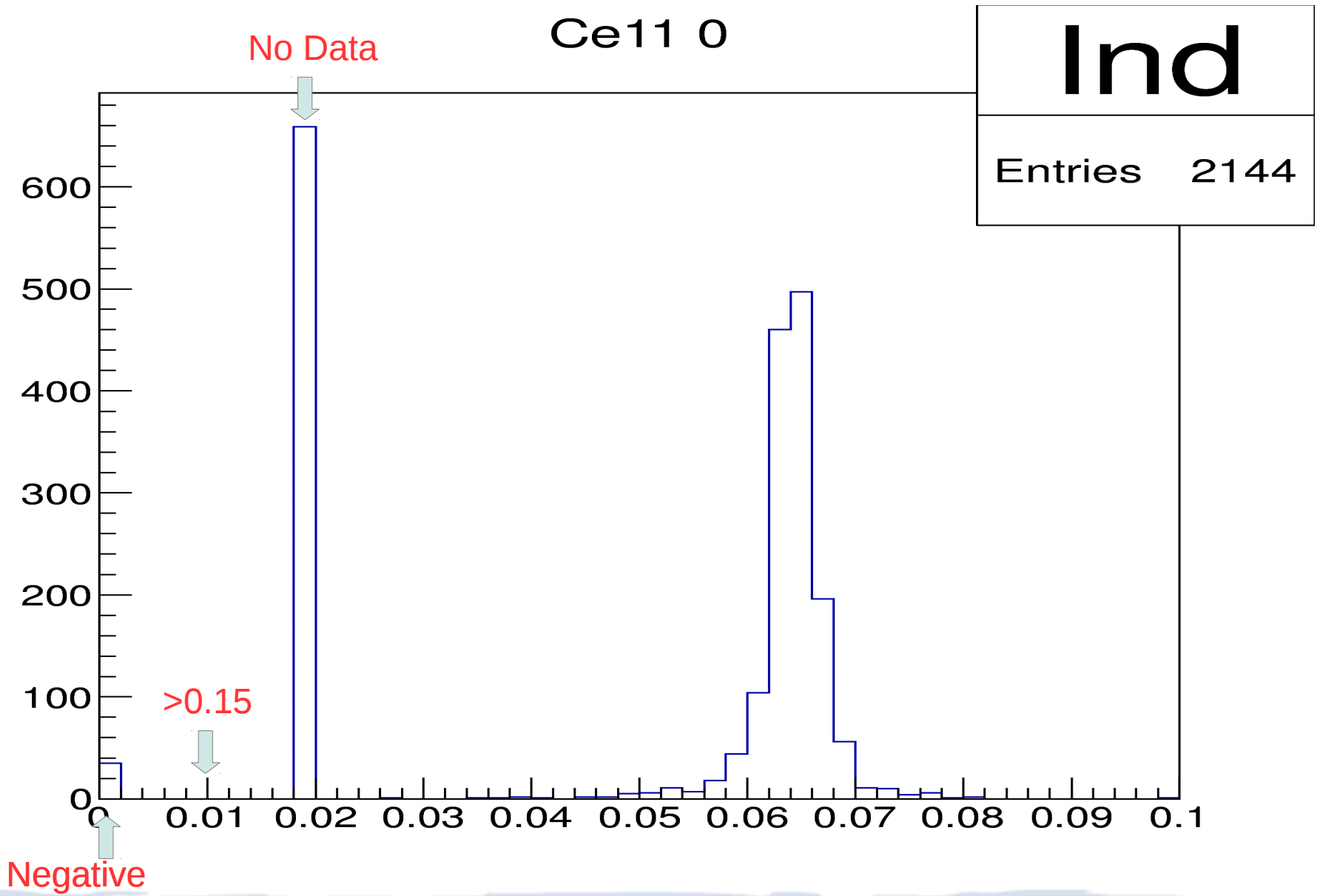
Y: 5000

Slope scatter plot



- Slope centered on 0.065
- Slope set to 0 if negative
- Slope set to 0.01 if greater than 0.15
- Slope set to 0.02 if no data is present

Slope Histogram



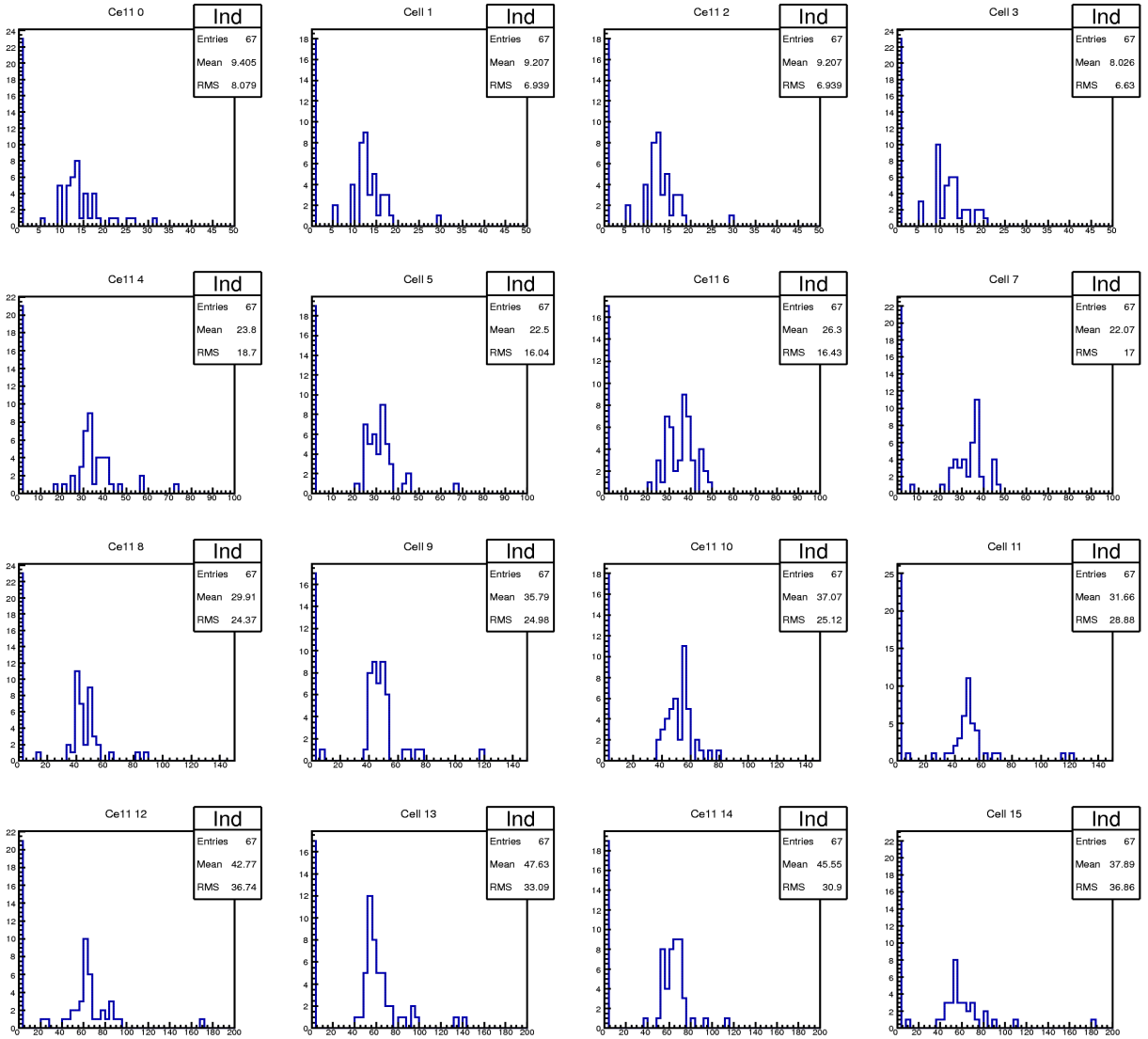
Calculations

- Using 0.5 (fiber fraction) x size x 2 MeV/cm /0.09

Row	Expected Energy (MeV)
1	17.17
2	34.34
3	51.50
4	82.00

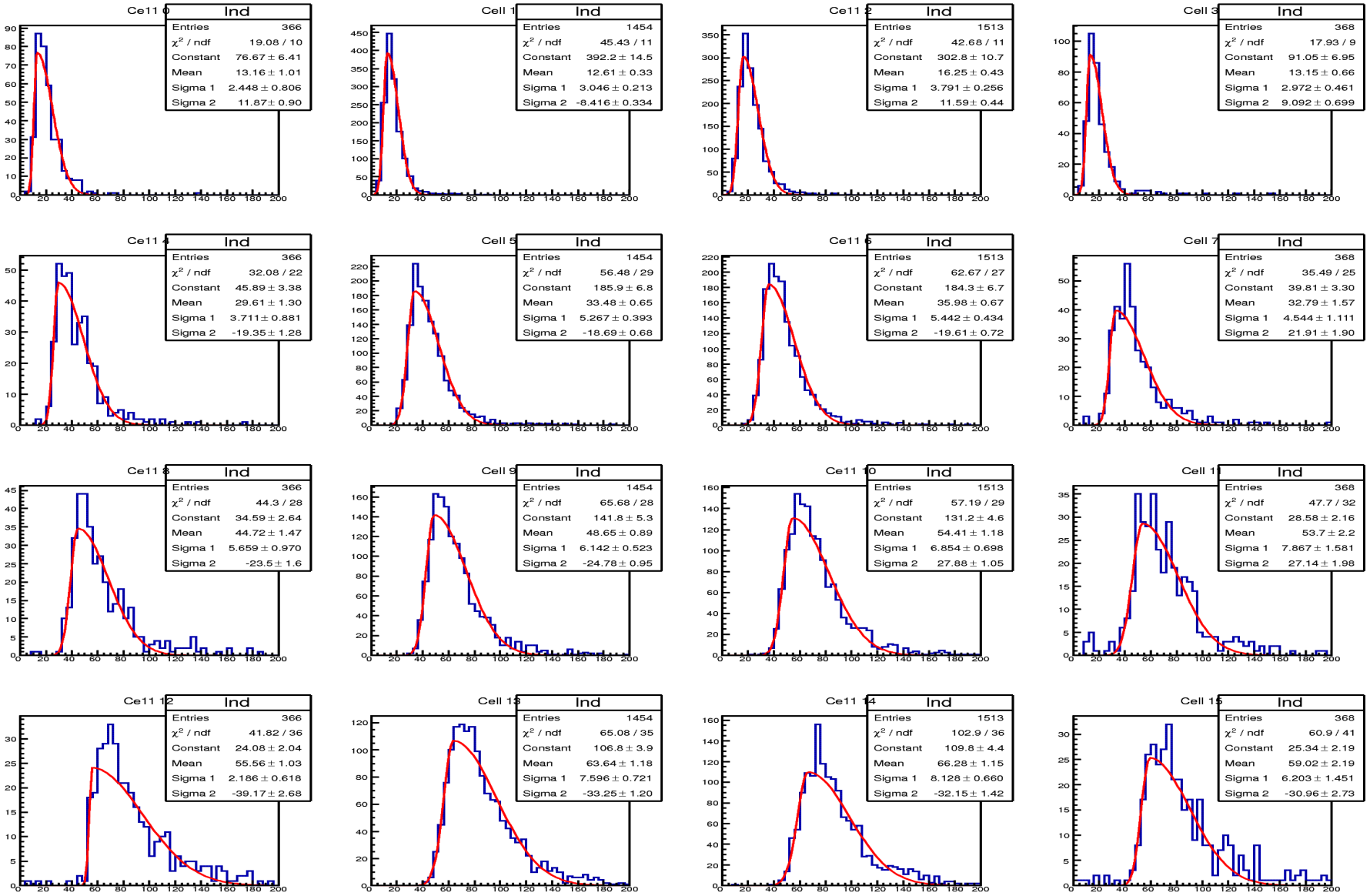
- Using 1 MeV/Peak height and 0.065 Peak height/sum find a conversion of 0.065 MeV/sum

Energy - Upstream

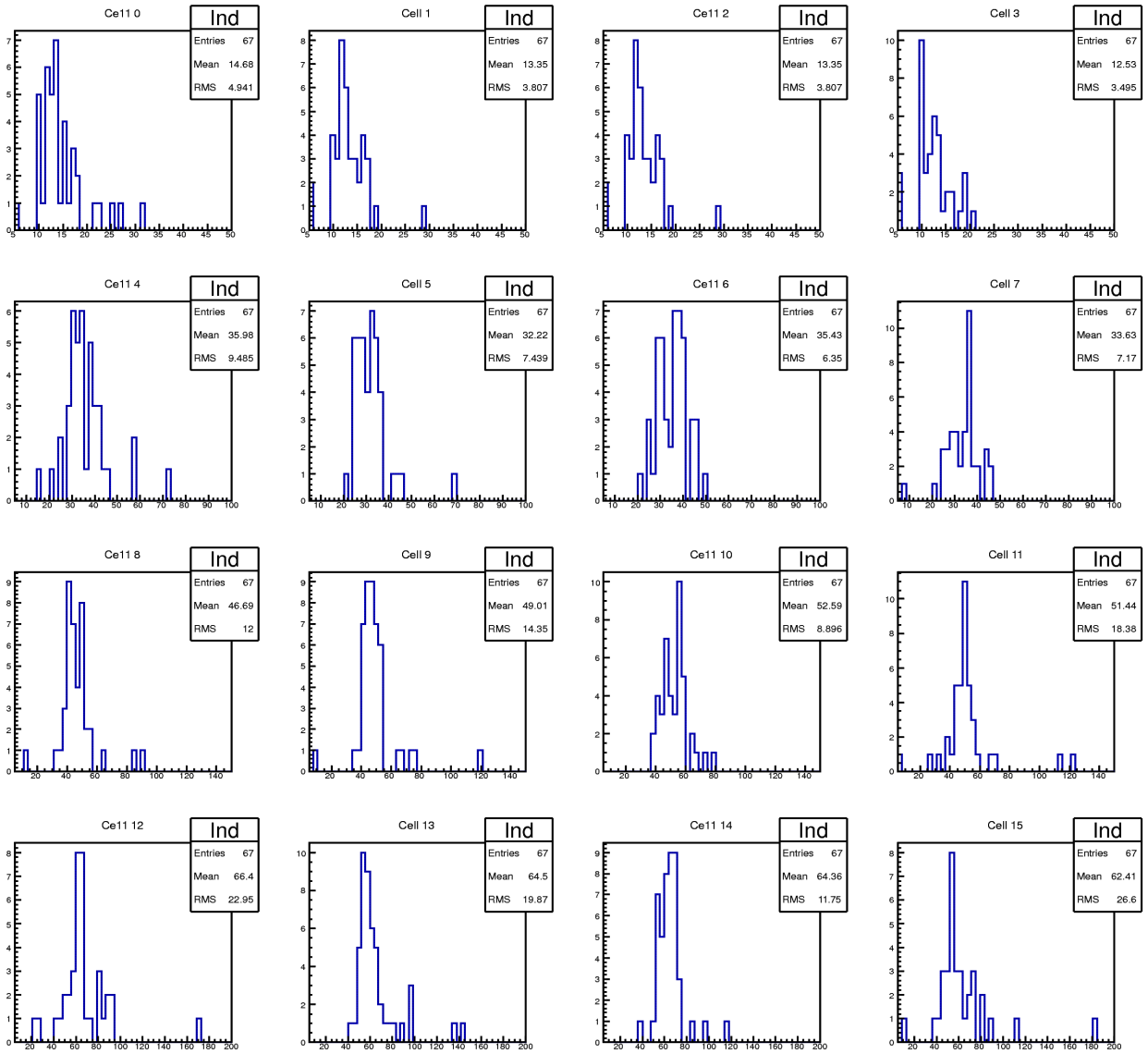


- Row 1: 9 MeV
- Row 2: 23 MeV
- Row 3: 35 MeV
- Row 4: 47 MeV

Sample Distribution – Mod 27



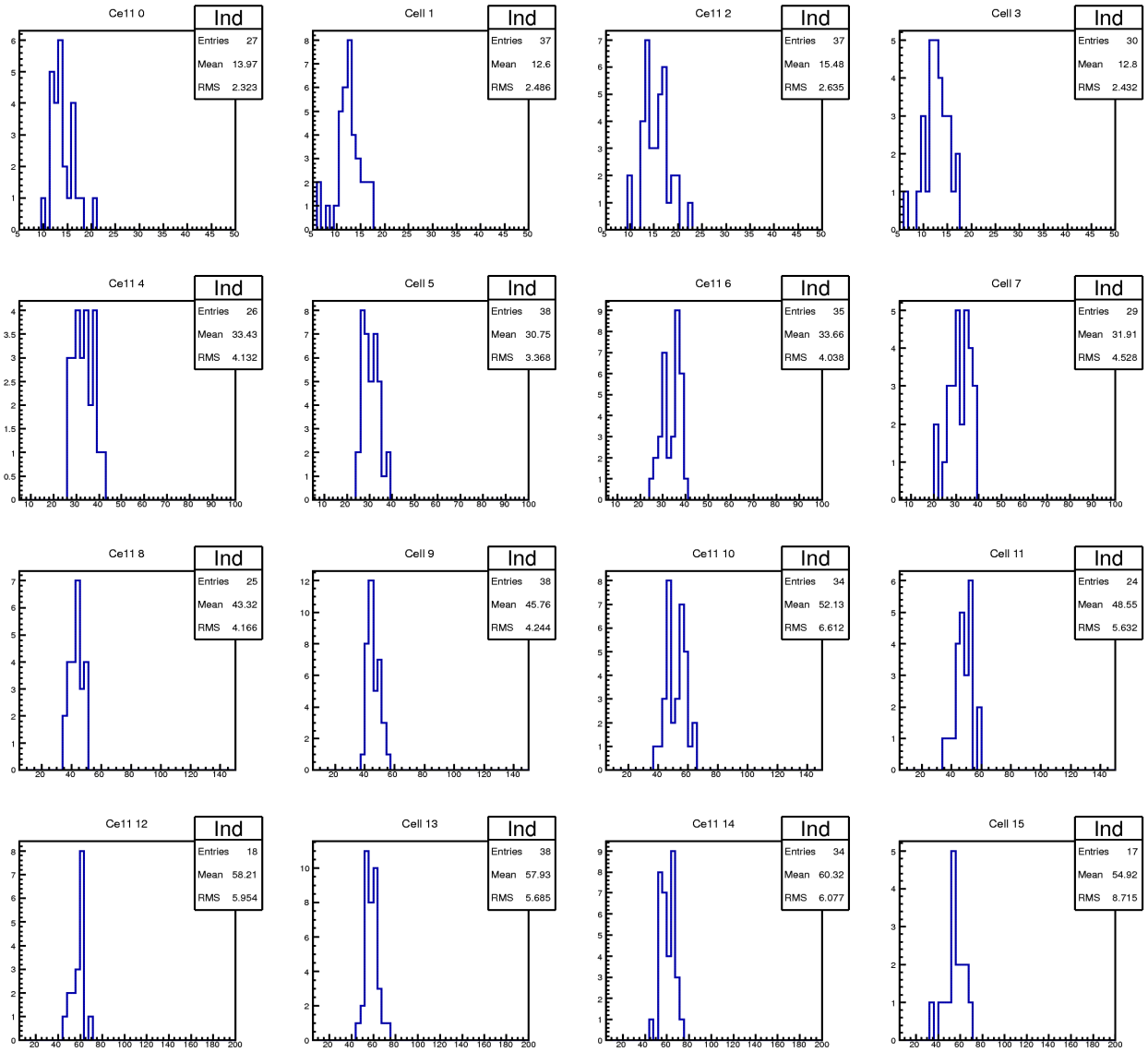
Energy – Upstream (0 removed)



- Row 1: 14 MeV
- Row 2: 35 MeV
- Row 3: 49 MeV
- Row 4: 65 MeV

- Row 4 may be lower due to larger light guides

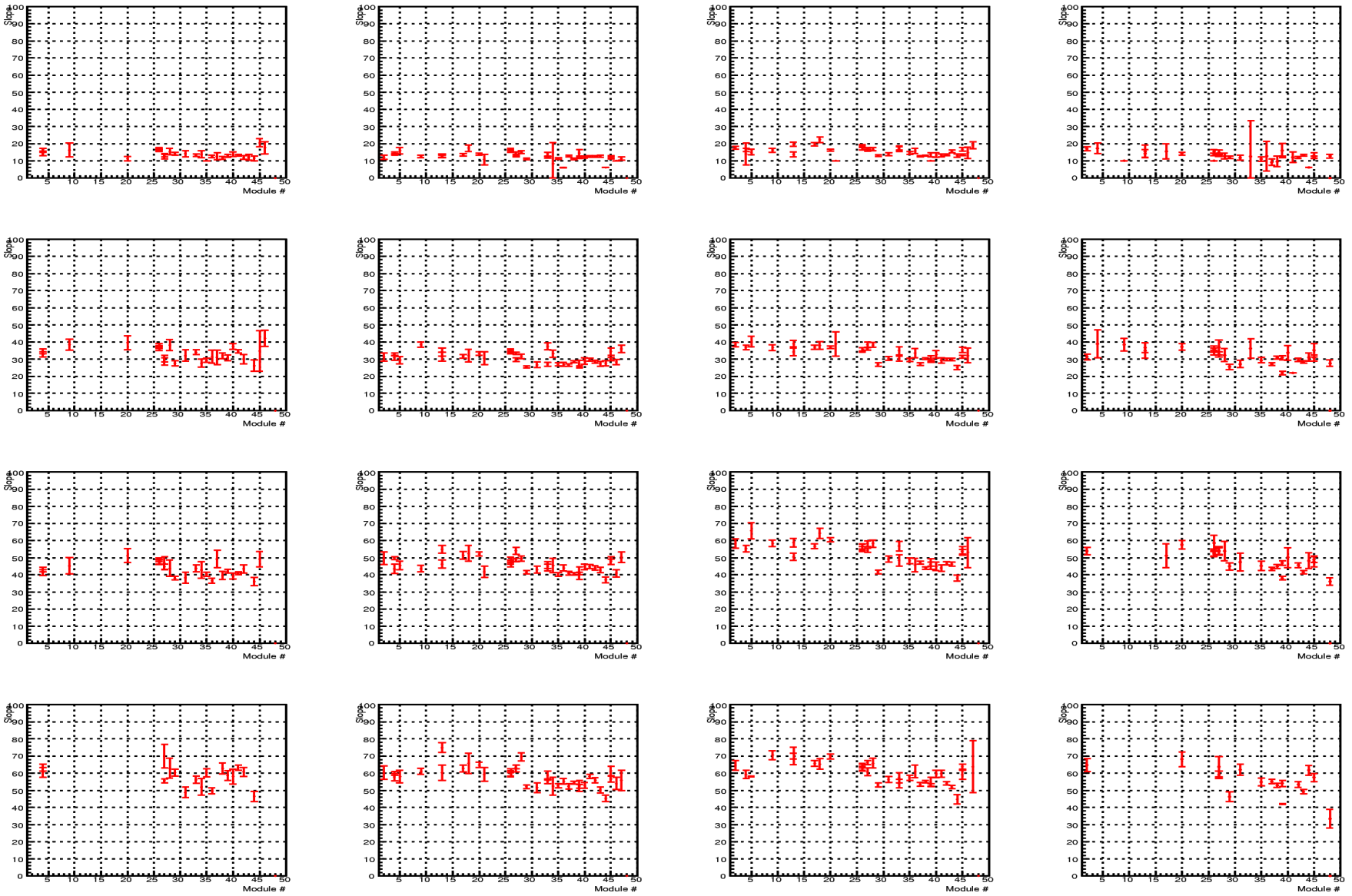
Energy – Cleaned Up (Upstream)



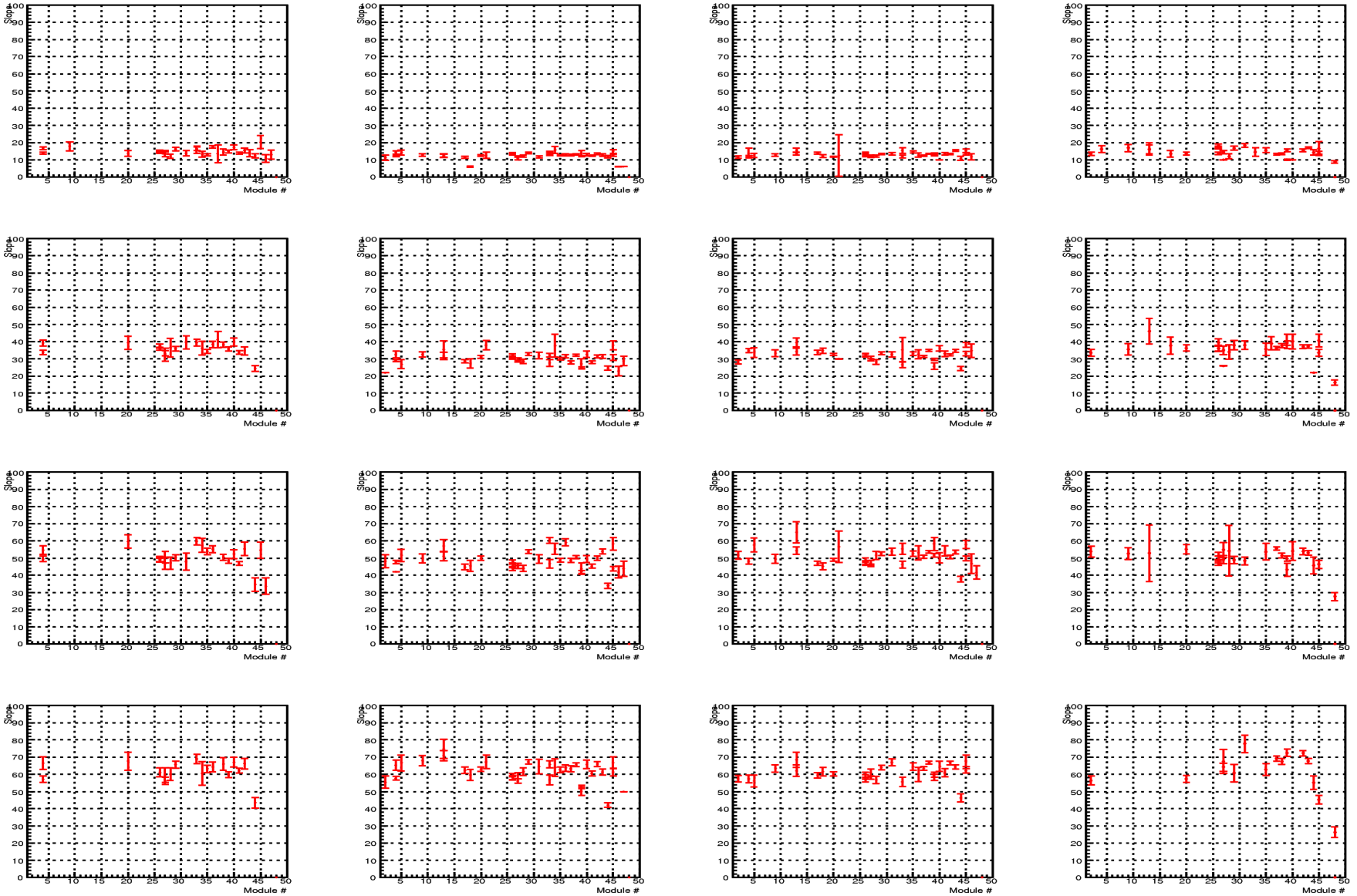
- Removed all modules with >50 good events
- Removed bad fits

Row	Expect	Actual (Col 2)
1	17.2	12.6
2	34.3	30.8
3	51.5	45.8
4	82.0	57.9

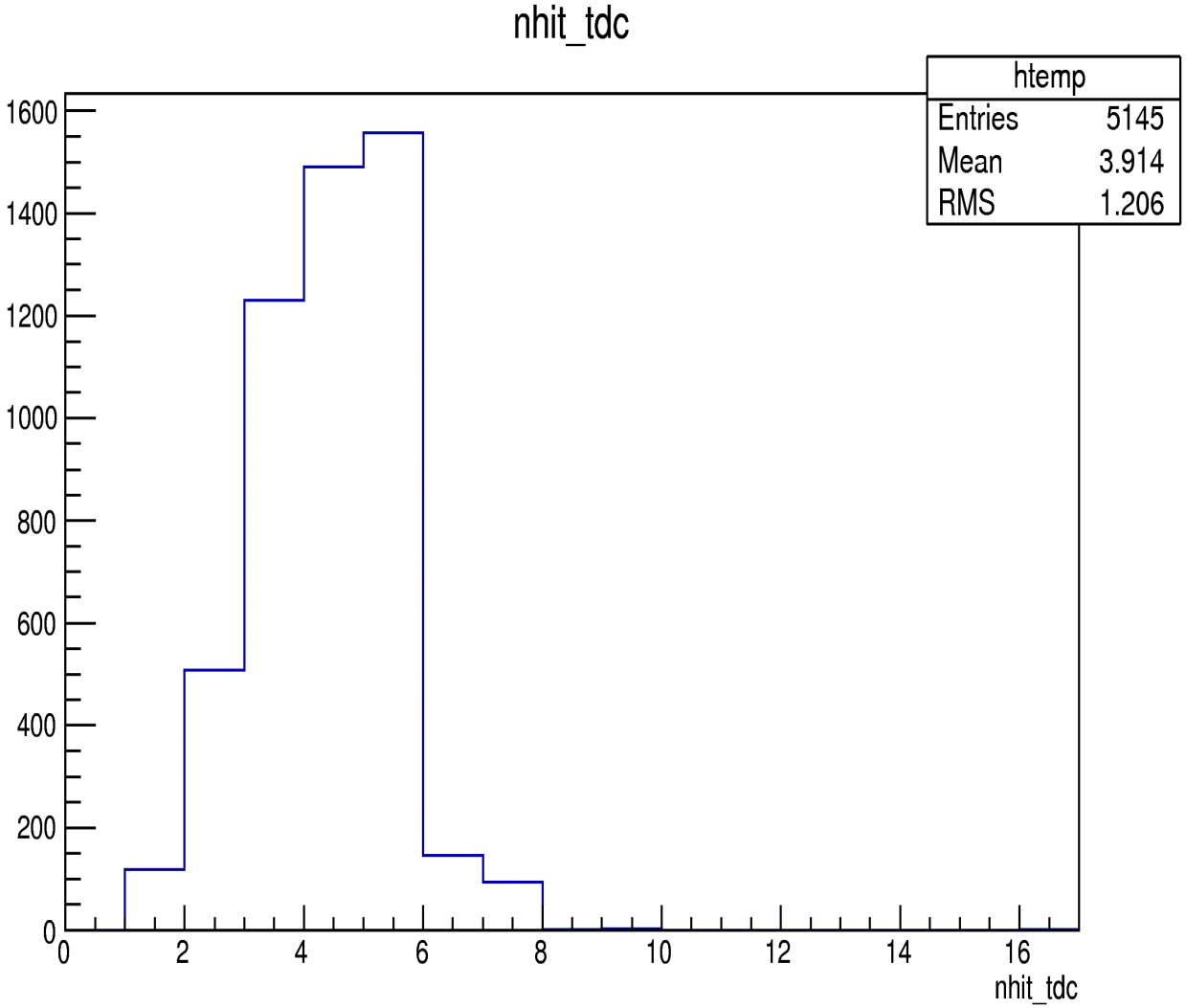
Energy Vs Mod Number - Upstream



Energy Vs Mod Number - Downstream

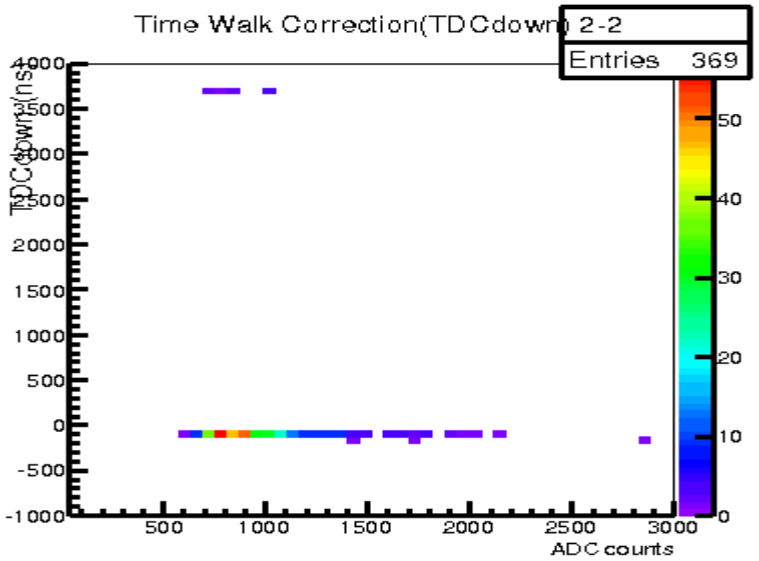


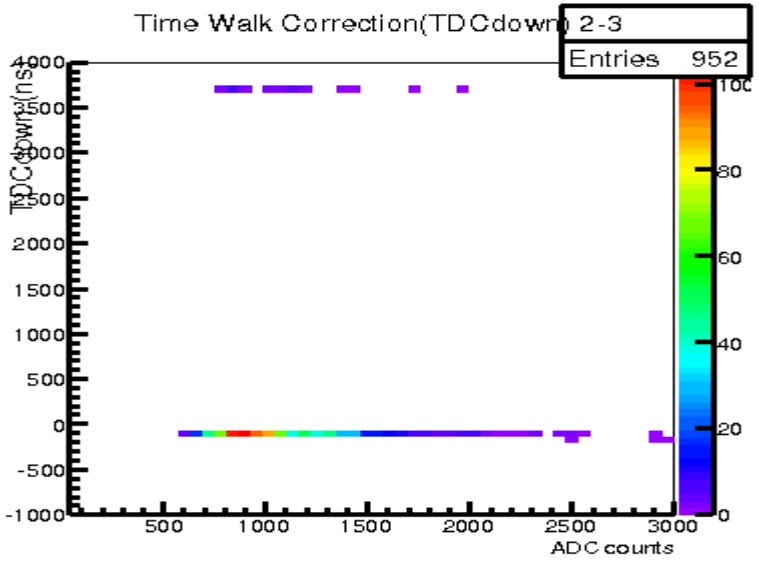
TDC Hits



- Each event has TDC information pertain to the number of channels which recorded TDC information
- Each event has an additional entry for the trigger scintillator (Ch 30)

TDC Information

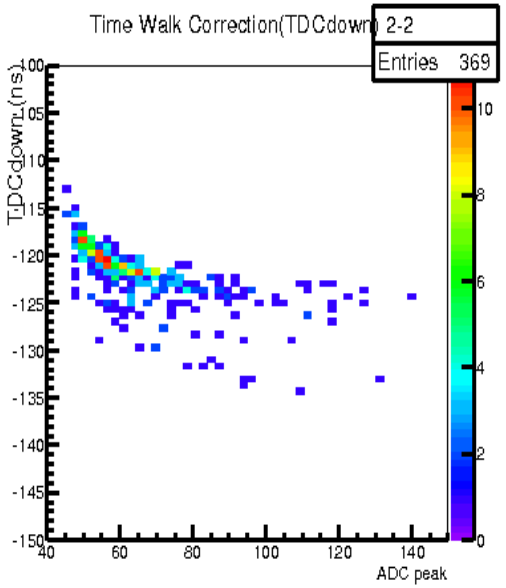


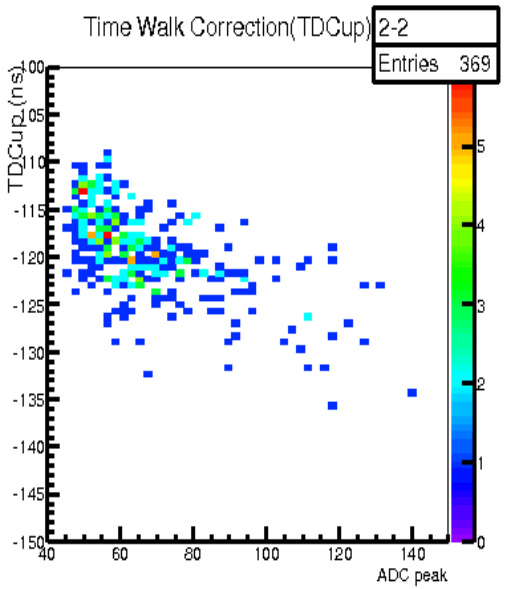


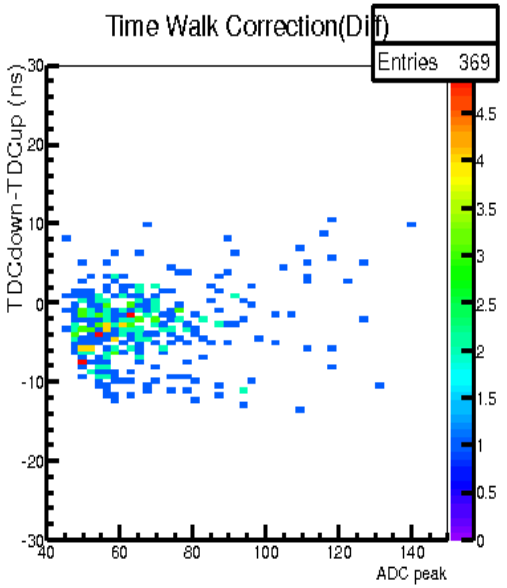
- Row 2, middle 2 cells displayed
- For every event in a cell the TDC information from the cell has the trigger scintillator TDC information subtracted

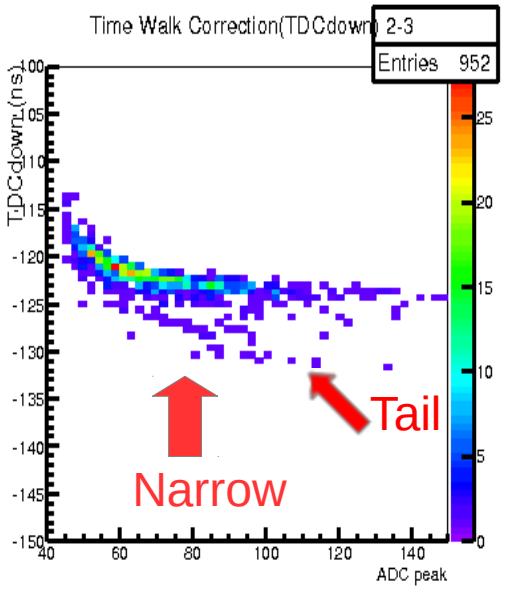
  TDC = TDCi – TDCtrig
- The results are plotted in a 2D histogram of TDC vs peak height for each pulse
- Investigating outliers near top of histogram (~4000 ns)

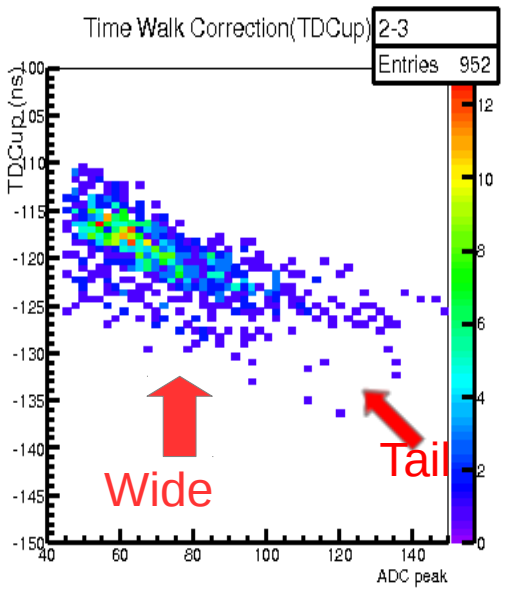
TDC Information

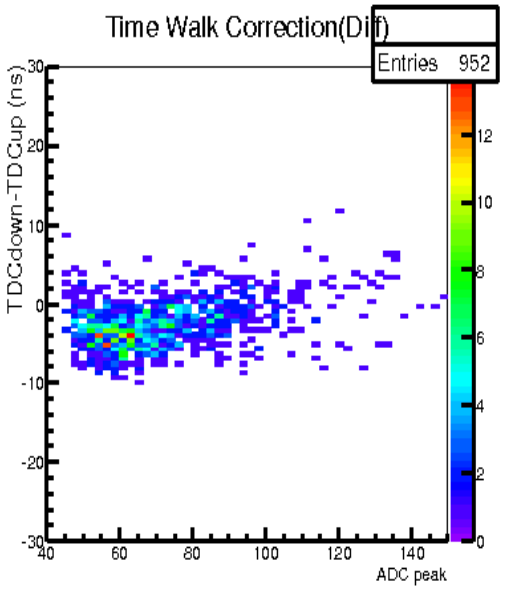












Down

Up

Down - Up

- Zoomed in on data near 0 ns
- Need to apply a time walk correction to data
- Investigating:
- Narrow vs Wide spread
- Increasing trend in Difference