# n3He Analysis : Up Down Asymmetry Latiful Kabir

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- Up down analysis with simplest possible cut
  Cuts:
  - -- Any bad run
  - -- Pulses around dropped pulses
- Run considered: All runs before DNP Run number range: 18000 - 50000 Number of Good runs: 25169

The complete run list can be found at /mnt/idata05/summary/runList.txt on basestar

# <u>Algorithm:</u>

- 1. Pair of events (one up and one down) considered to form each asymmetry for each wire.
- 2. Each detector signal is normalized by sum of all the detector signals for that event.
- 3. Asymmetry for pair of events,

$$\mathsf{A}_{\mathsf{K}} = \frac{Y_{+}^{\kappa} - Y_{-}^{\kappa}}{Y_{+}^{\kappa} + Y_{-}^{\kappa}}$$

K= pair of events index

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4. Physics asymmetry for each wire is calculated using,

 $\alpha_{\kappa} = \frac{1}{G_{\kappa}} \frac{Y_{+}^{\kappa} - Y_{-}^{\kappa}}{Y_{+}^{\kappa} + Y_{-}^{\kappa}}$ K= wire index And error,  $\delta \alpha_{k} = \frac{1}{|Gk|} \delta A_{k}$ Where  $G_{\kappa}$  is the geometric factor for that wire. 5. The correction for correlation is NOT included yet.



## M1 voltage distribution for all GOOD runs in 18K-50K



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# M1 voltage distribution for all GOOD runs (run#18K-50K)



## Splitting the analysis in small segments

□ Runs numbers considered in the range 18K – 50K The range is divided in small segments of 2K runs each making a "level" of analysis. i.e. L1= 18-20K, L2=20-22K, L3=22-24K ... ... • For each level asymmetry is calculated and all the 144 histograms are saved in root files. At the end I have 16 roots files, from which then histograms are merged(added) together to get asymmetry for the entire run ranges(18K – 50K).

### Raw Asymmetry for all good runs in 18-50K run range



### <u>Raw Asymmetry for all good runs in 18-50K run range</u> (Front Layers & Zoomed)



### Physics Asymmetry for all good runs in 18-50K run range



### Physics Asymmetry for all good runs in 18-50K run range



### <u>Physics Asymmetry for all good runs in 18-50K run range</u> (Front Layers & Zoomed)



#### Raw Asymmetry with Layers Separated(for better view)



#### Raw Asymmetry with Layers Separated , front layers( for better view)



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#### Physics Asymmetry with Layers Separated(for better view)



#### Asymmetry Trendline by Run Ranges (In units of 10-9)



Level# of analysis  $\longrightarrow$ 

### <u>Next:</u>

- --- Use corrected geometry factor
- --- Include corrections for correlations between wires.