

# Data Analysis for Bo VST

## Sample Selection and Preprocessing

### Talk 2 of 6

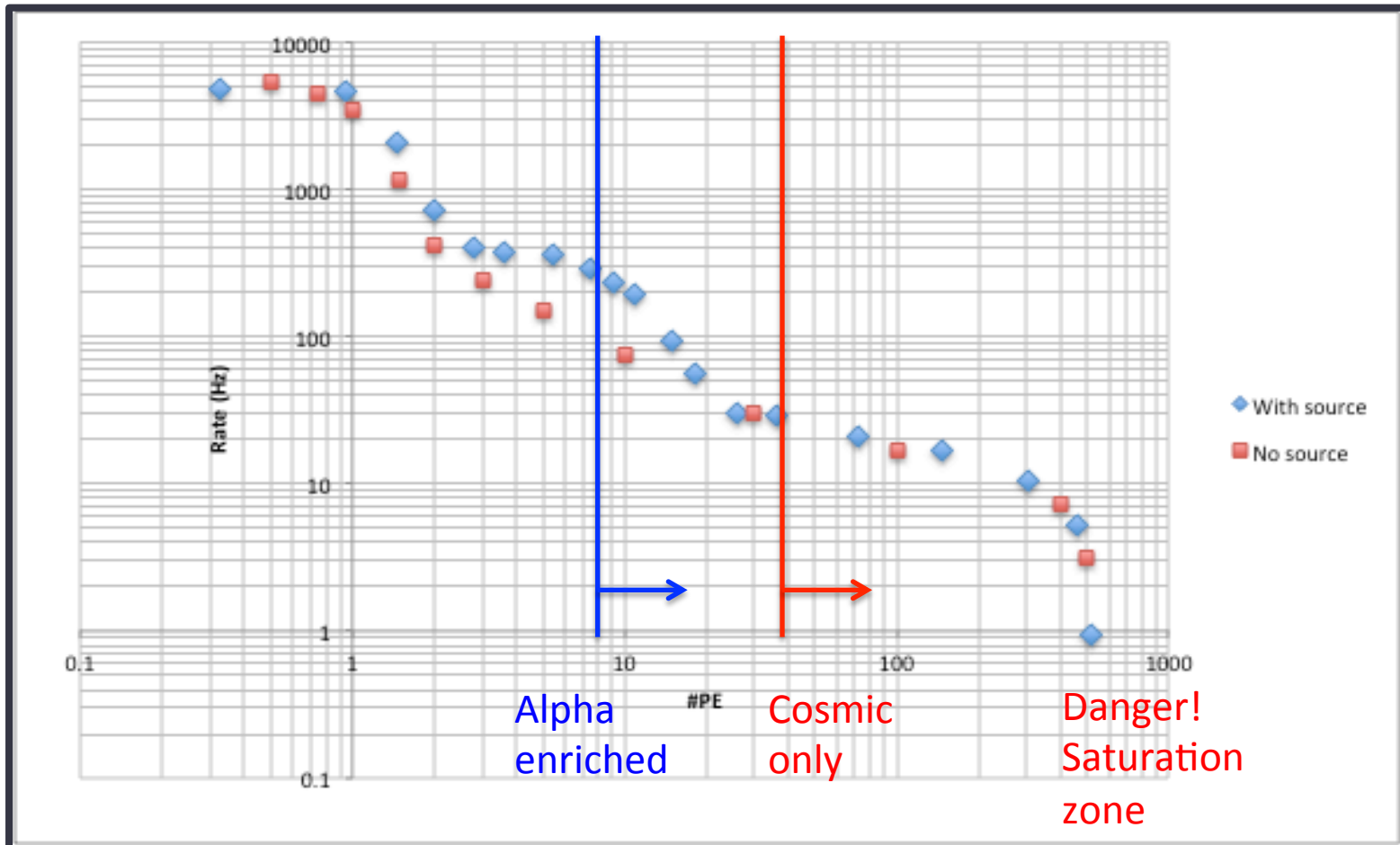
Ben Jones

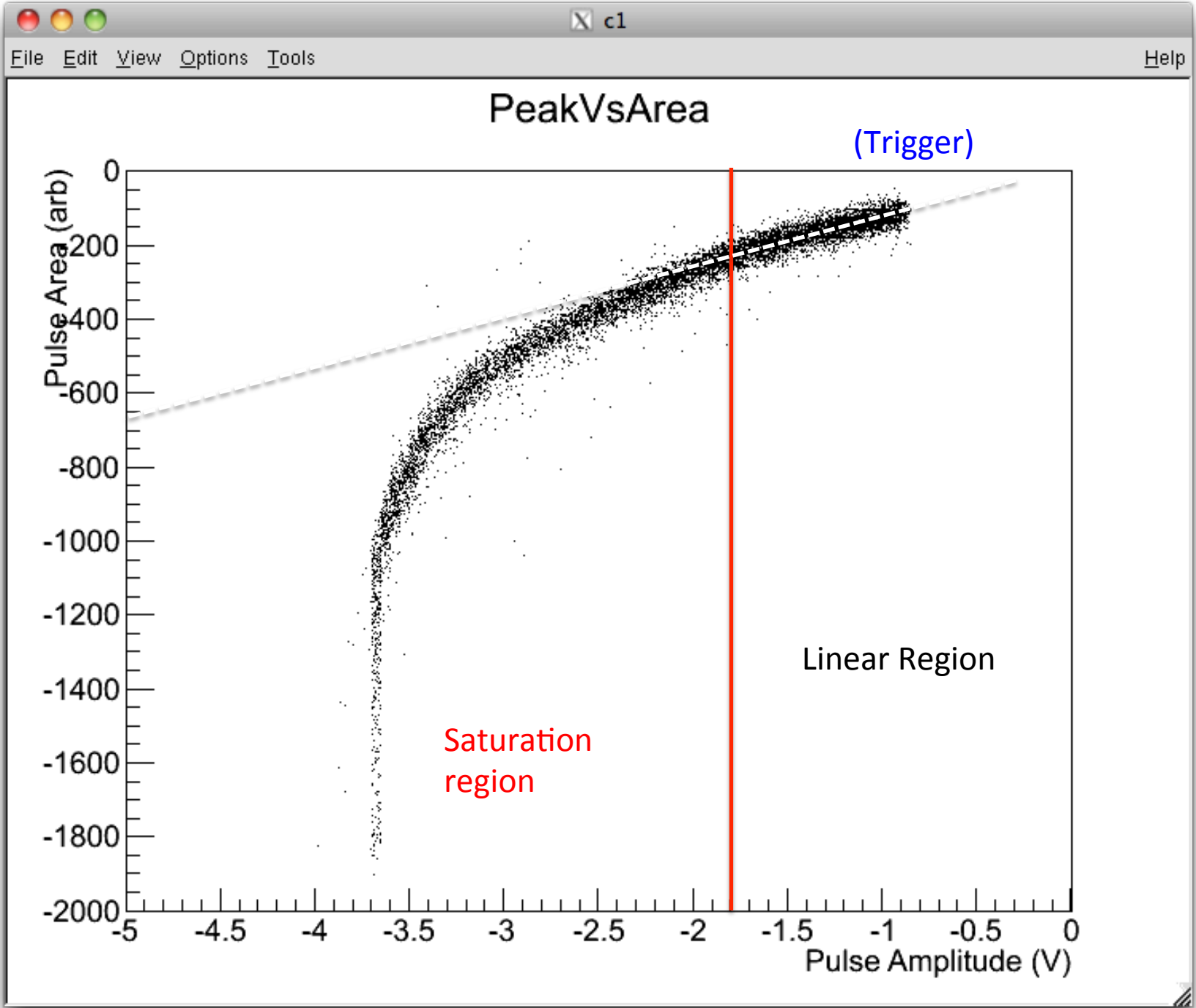
# Data Acquisition

- In each run we record 10,000 events.
- We use an edge trigger to select cosmic and alpha enriched samples with thresholds:
  - Alpha enriched sample : 50mV
  - Cosmic sample: 500mV
- Scope sampling rate is 1GS/s, and data is recorded for 5 microseconds.
- Point-to-point interpolation and digital bandwidth filtering are both disabled
- Output data format is .csv
- Final dataset for LN2 injection data is 80GB in text files.

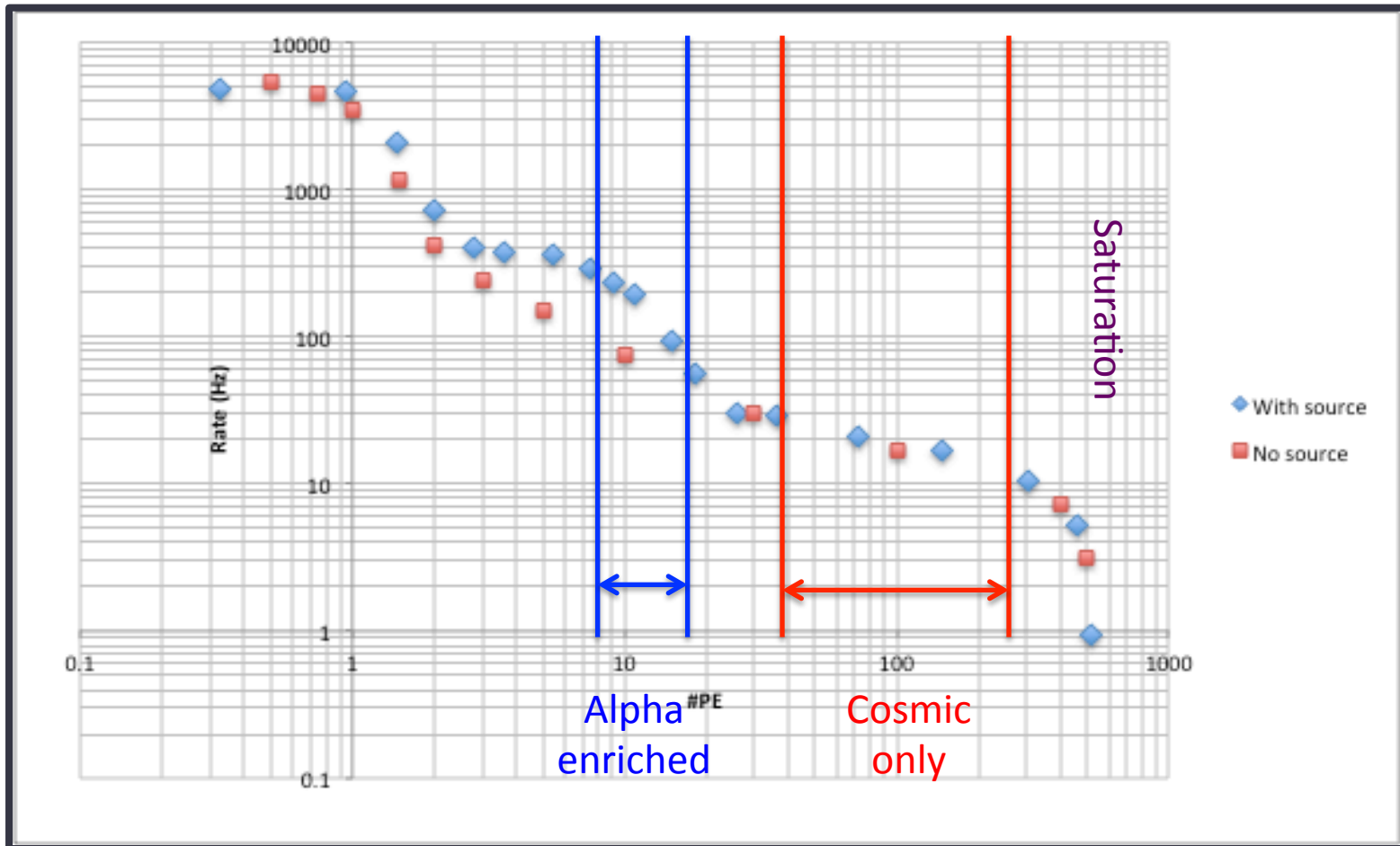
# Samples:

- In this analysis we have two data samples:
  - Alpha enriched sample, cosmic sample



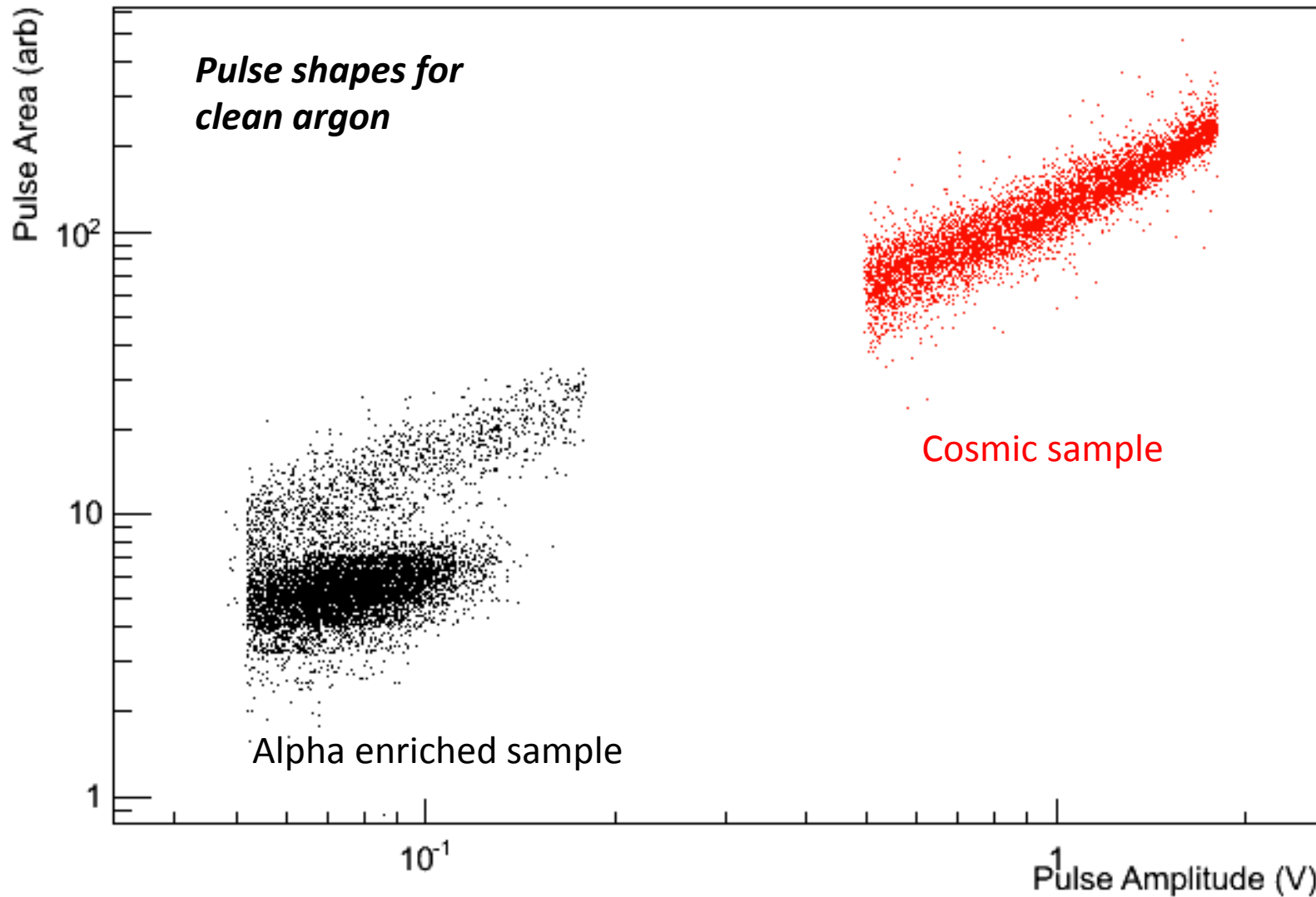


- Apply upper limits to samples to limit saturation and cross contamination



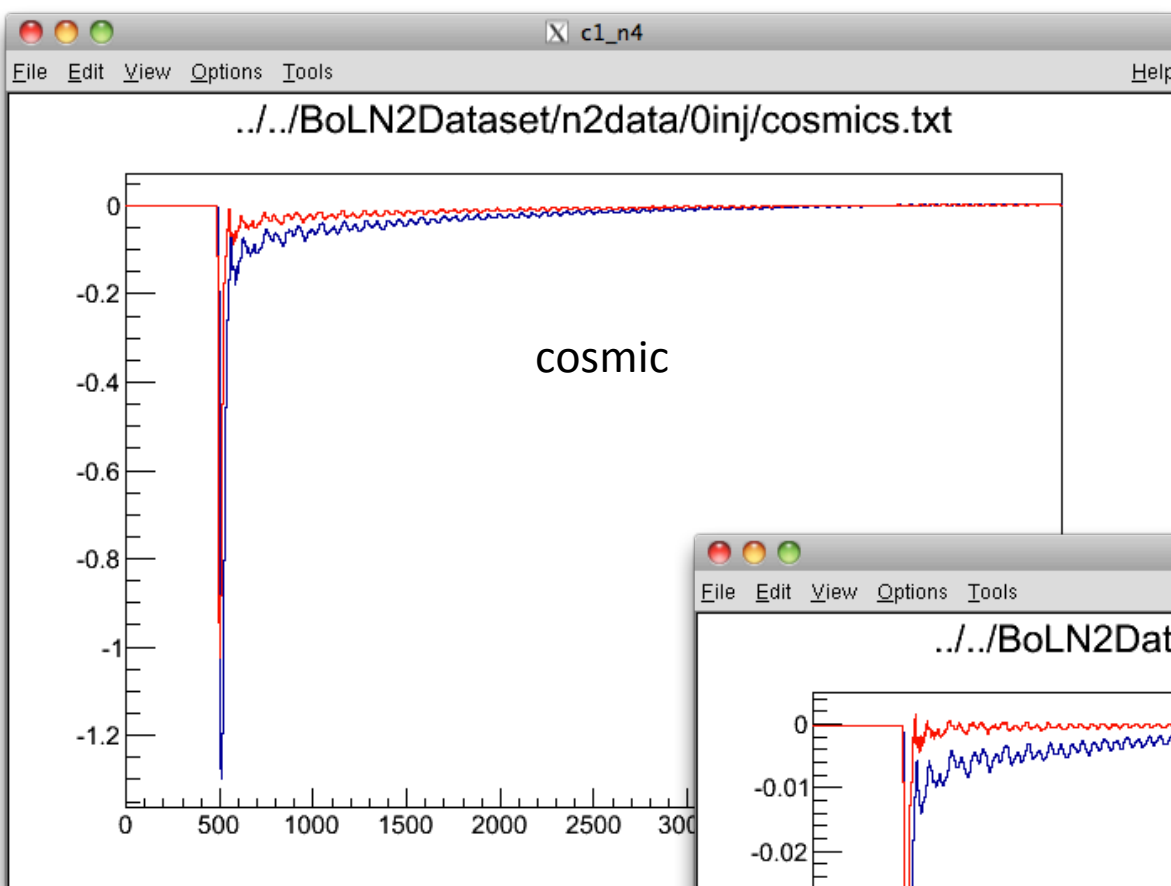


# PeakVsArea



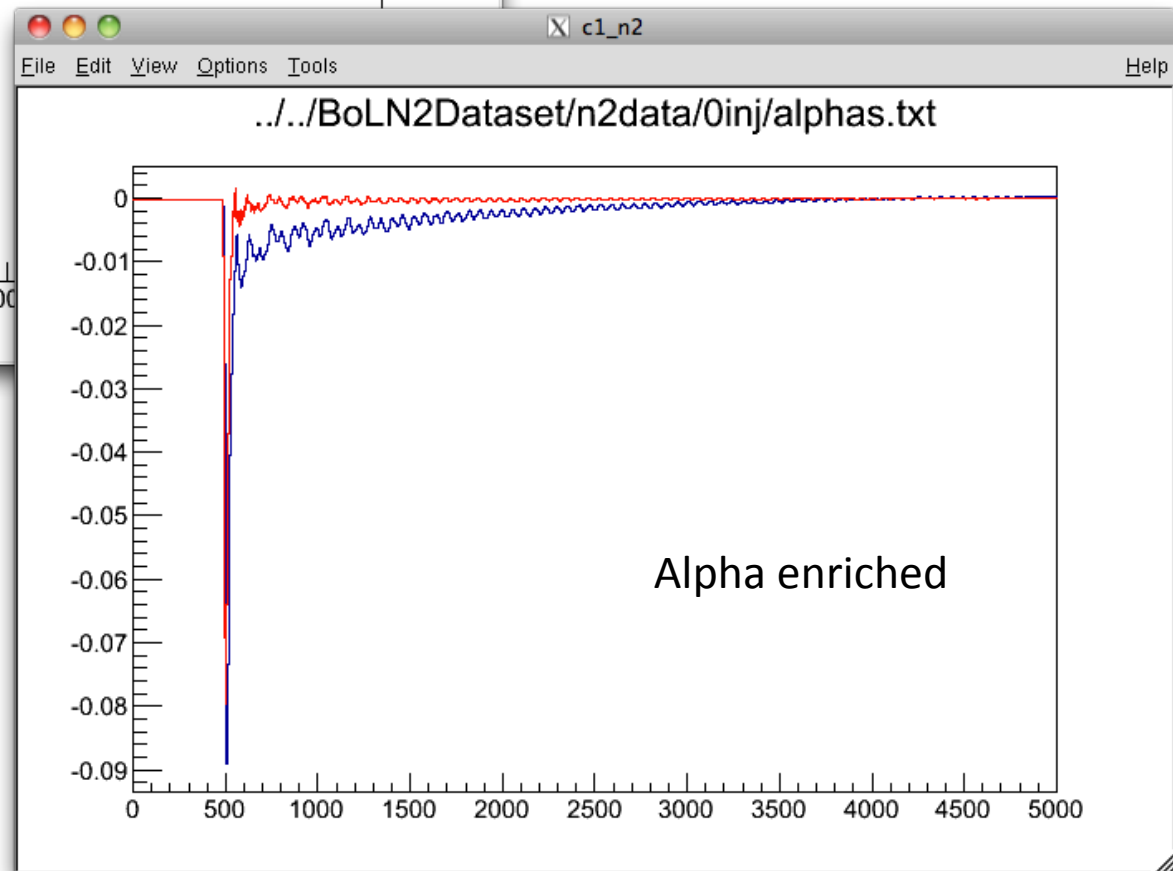
# Pulse preselection

- CSV files are read by root macros which:
  - Remove multiply peaked pulses
  - Remove pulses which saturate scope limits
  - Re-align pulse times such that peak bins are all simultaneous (prevent trigger slew)
- Pulses surviving cuts are summed to give an average pulse shape for the sample.



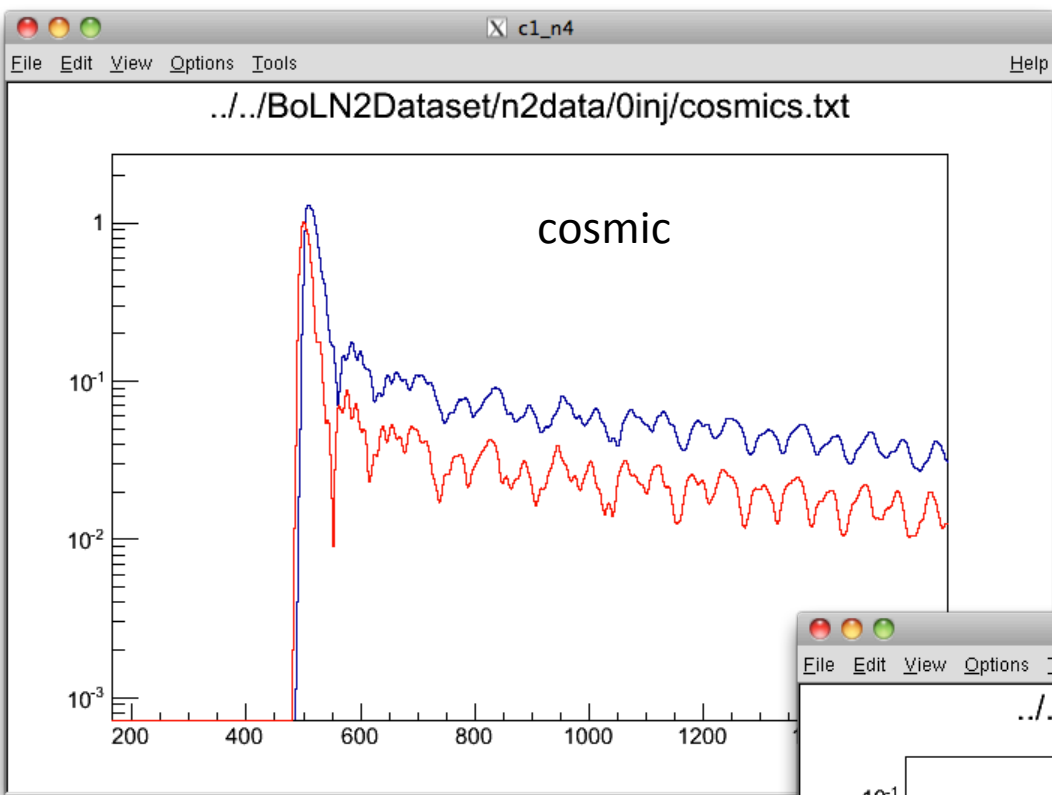
Average pulses after late light removal

Average before pre-processing  
Average after pre-processing

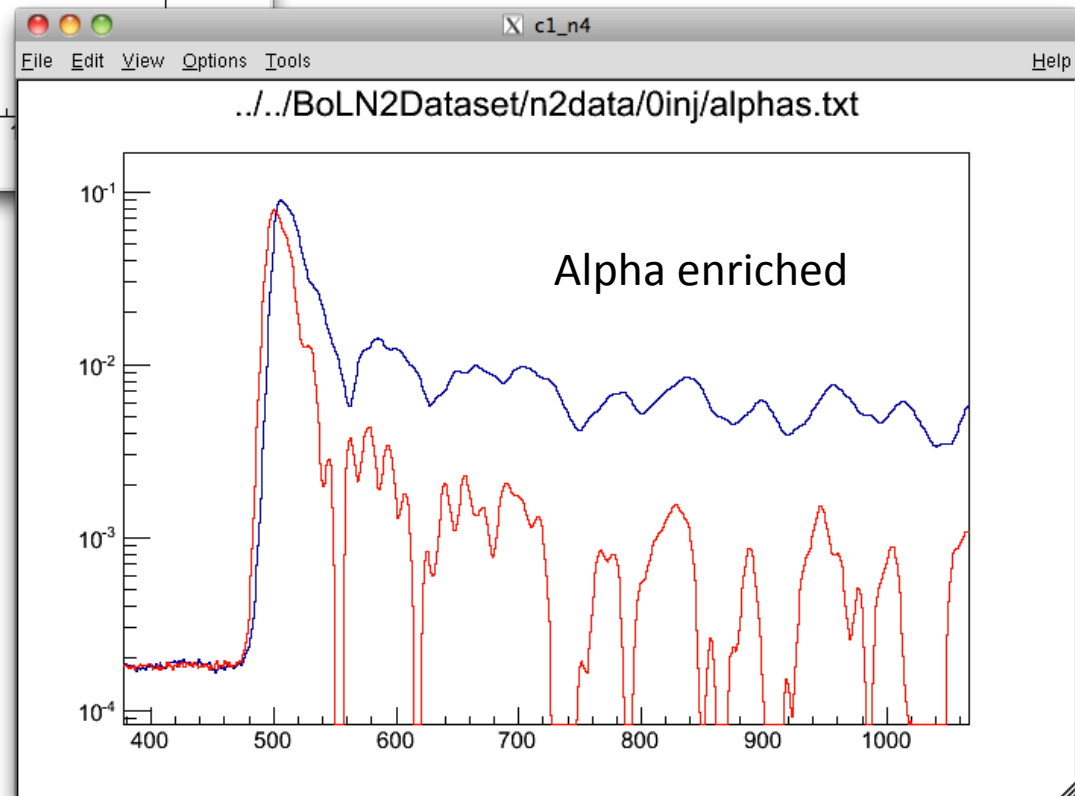


In both cases, discarding saturated pulses removes a misleading extra late-light component.





Average before pre-processing  
Average after pre-processing



Also clear sharpening of initial peak due to time alignment

# Signal Processing

- Now the goal is to remove all the ugly ringing and find out when the light actually arrived.
- This leads me onto the next talk...