Status of light studies for the 3x1x1 review

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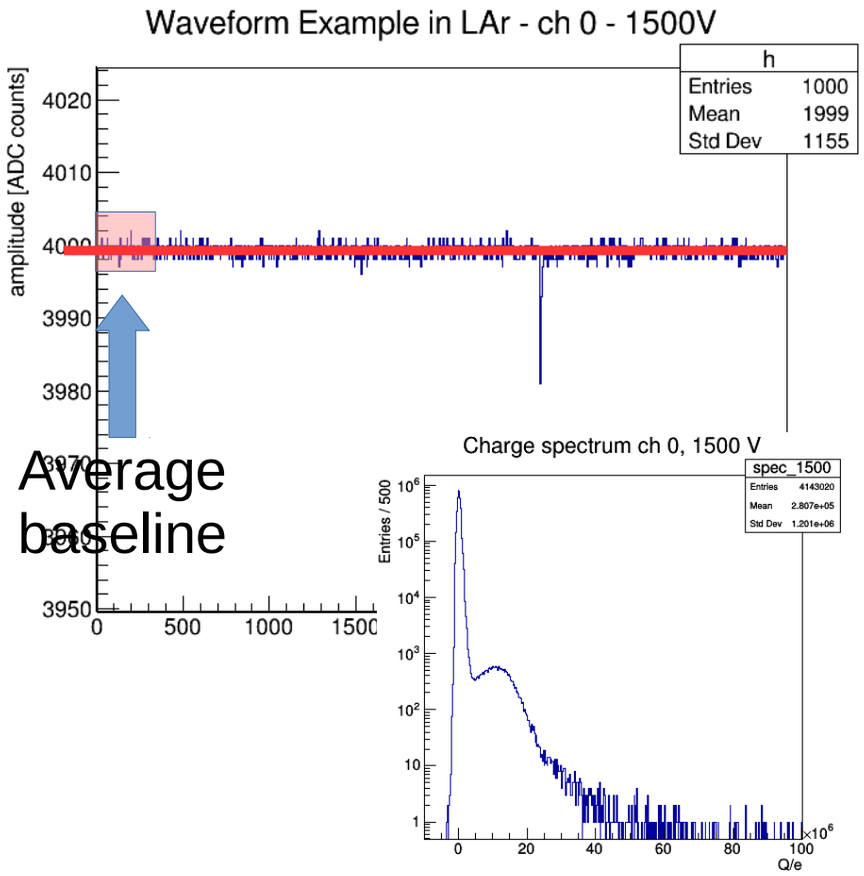
Highlight

- Summary of the studies ongoing for the 3x1x1 review
  - PMT calibration and bases comparisons
  - LAr purity monitoring
  - S1 studies
  - S2 studies
- All studies are still ongoing…

PMT calibration and base comparisons

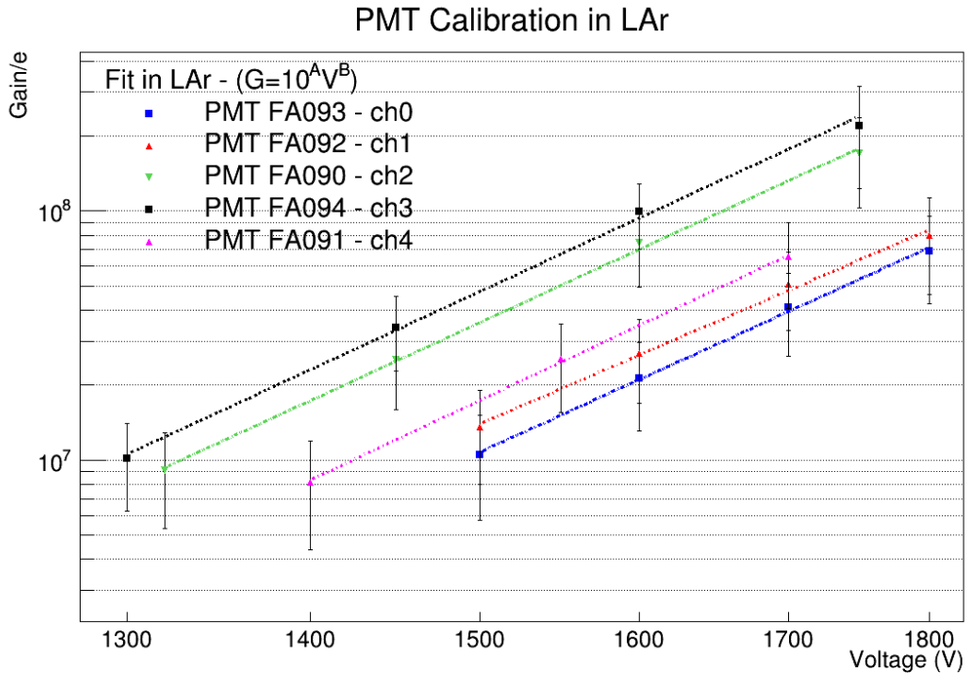
Jose

Summary of PMTs calibration



- 3x1x1 PMTs has not been calibrated in Lar with a dedicated set-up, but only in air at Room Temperature.
- We don't have a dedicated calibration system as we will have in the 6x6x6.
- Thus, the calibration has been performed reconstructing the SPE spectrum integrating every fluctuation below the baseline, from data taken with a pulser (“random trigger”) inside the detector.

- An increase in the gain for 3 of the PMTs has been observed (in comparison with Room Temperature). To be understood.

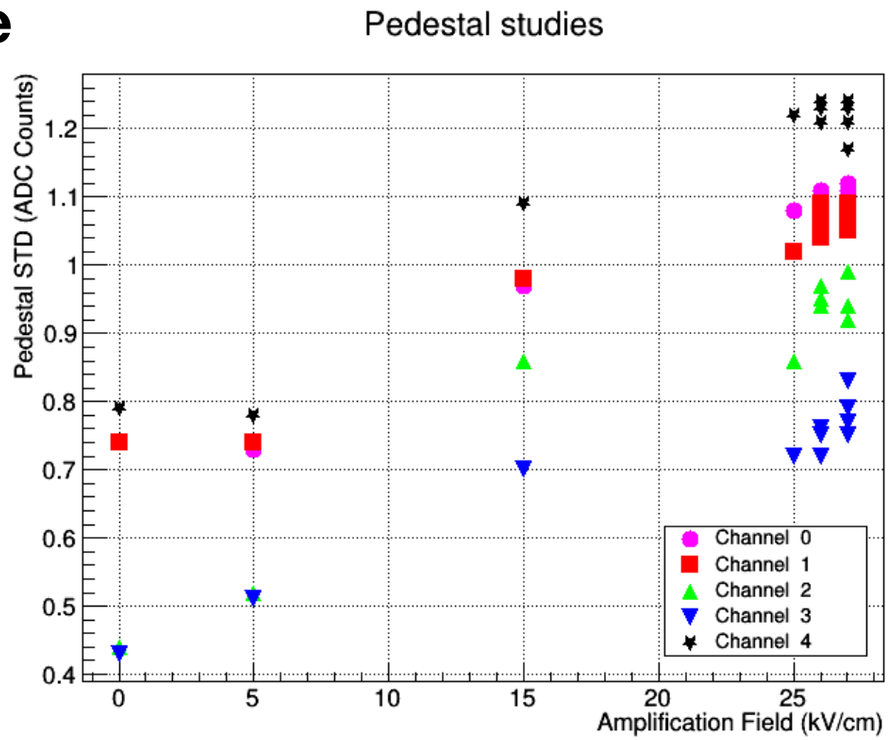


A gain stability studies is ongoing

For more detail:
See Jose's slides from 4 August 2017 Operational Meeting

Summary of the waveform studies

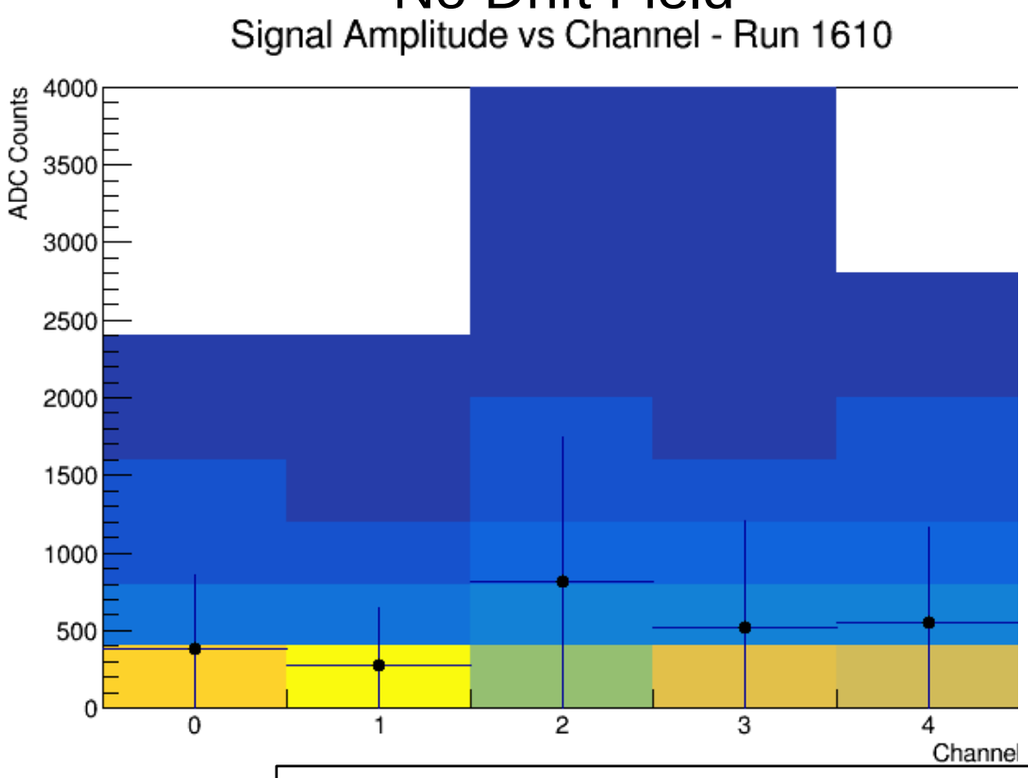
Jose



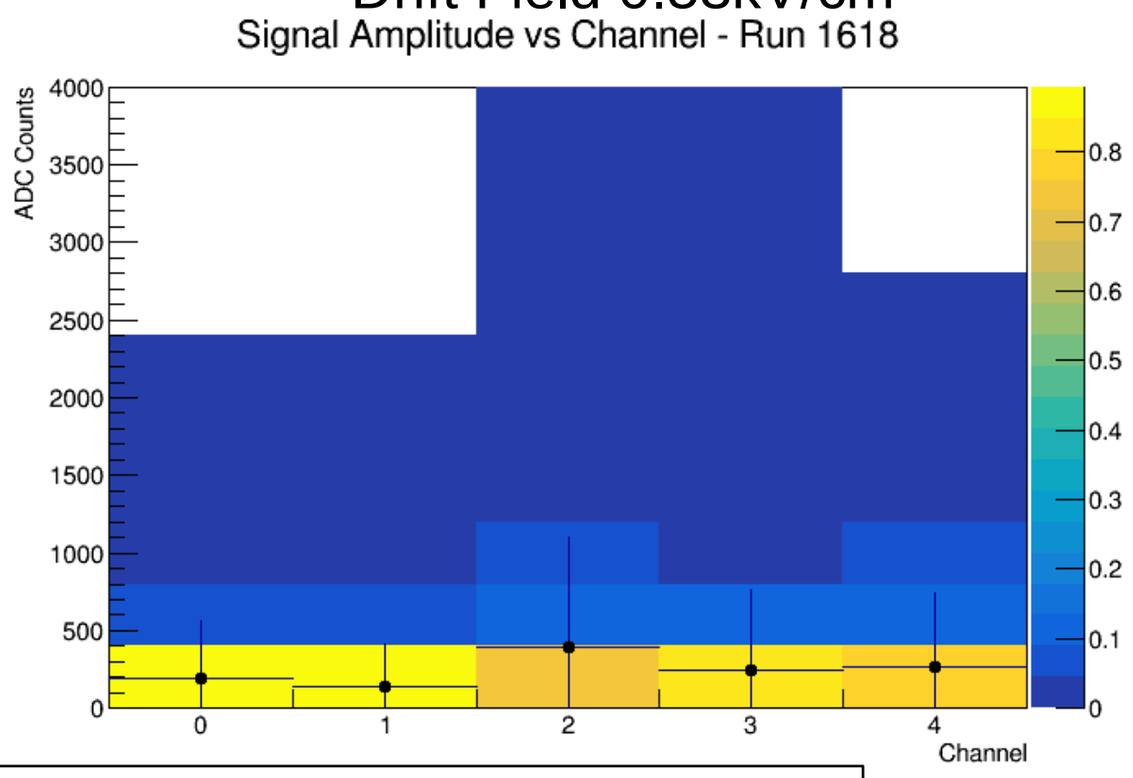
- Pedestal width remain quite stable (~1ADC), even under high amplification fields.
- One-cable based (positive) PMTs show a thinner pedestal.

Negative based PMTs:	Channel 0, 1 & 4
Positive based PMTs:	Channel 2 & 3

No Drift Field

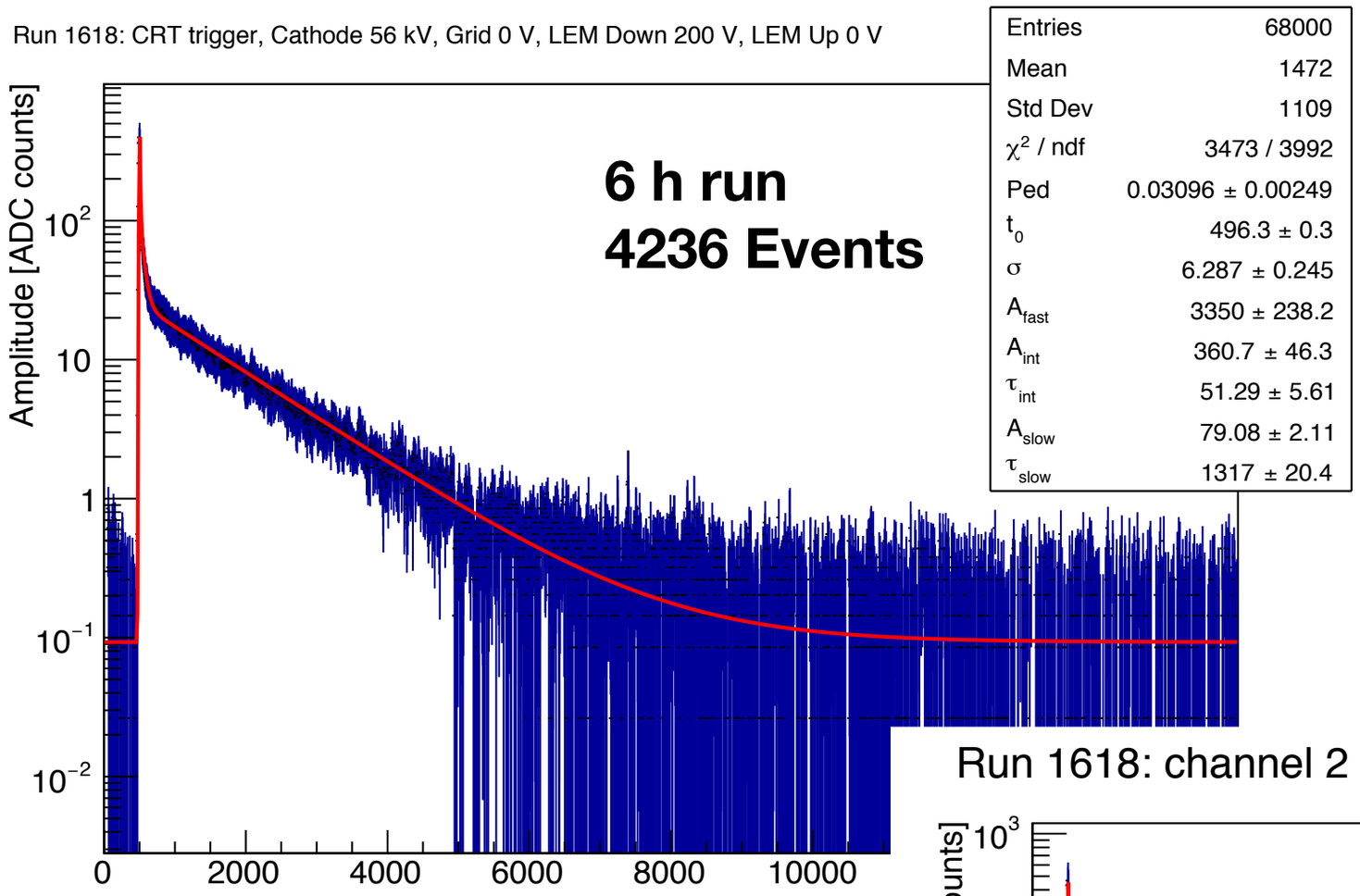


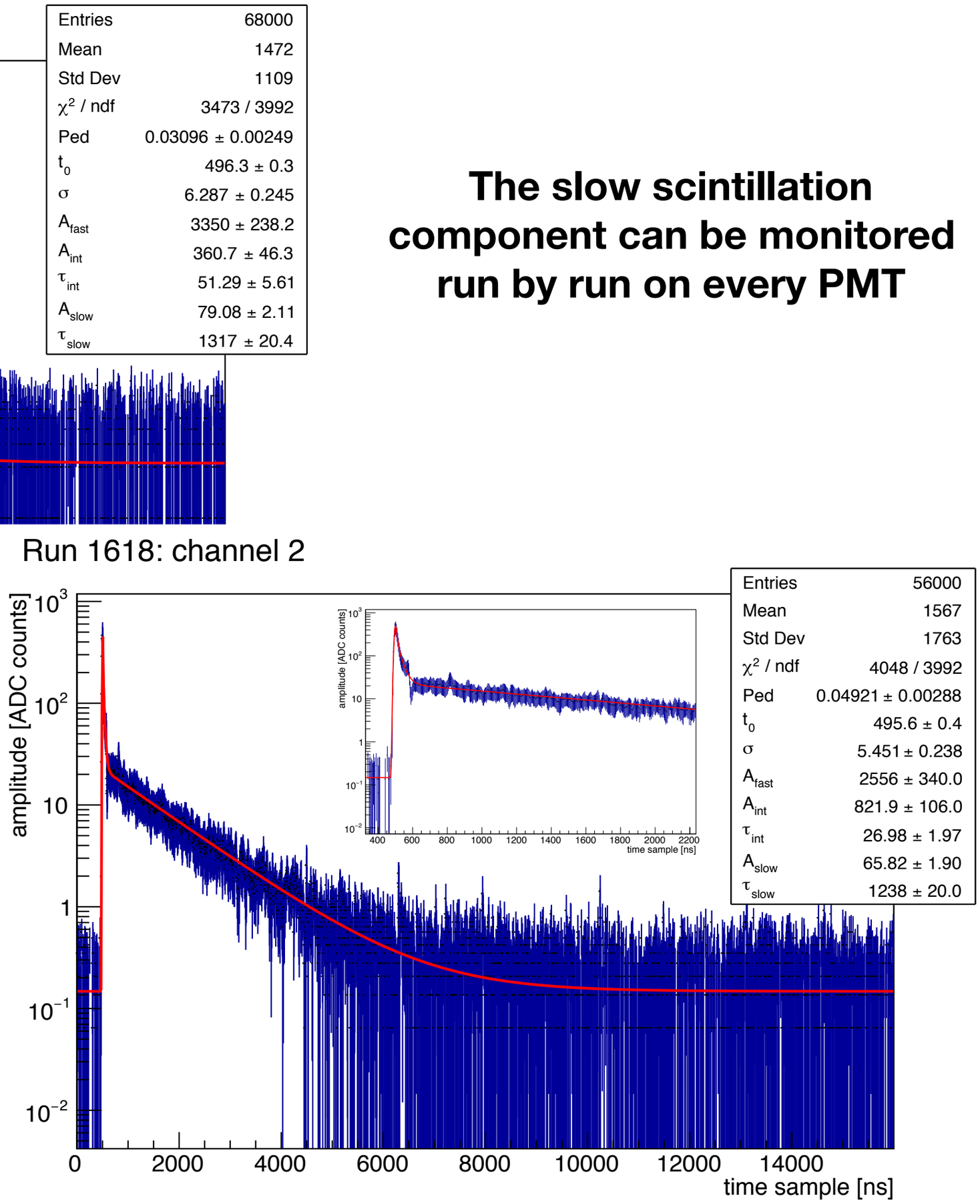
Drift Field 0.53kV/cm



As the drift field increase, the S1 amplitude is reduced, since less recombination occurs.

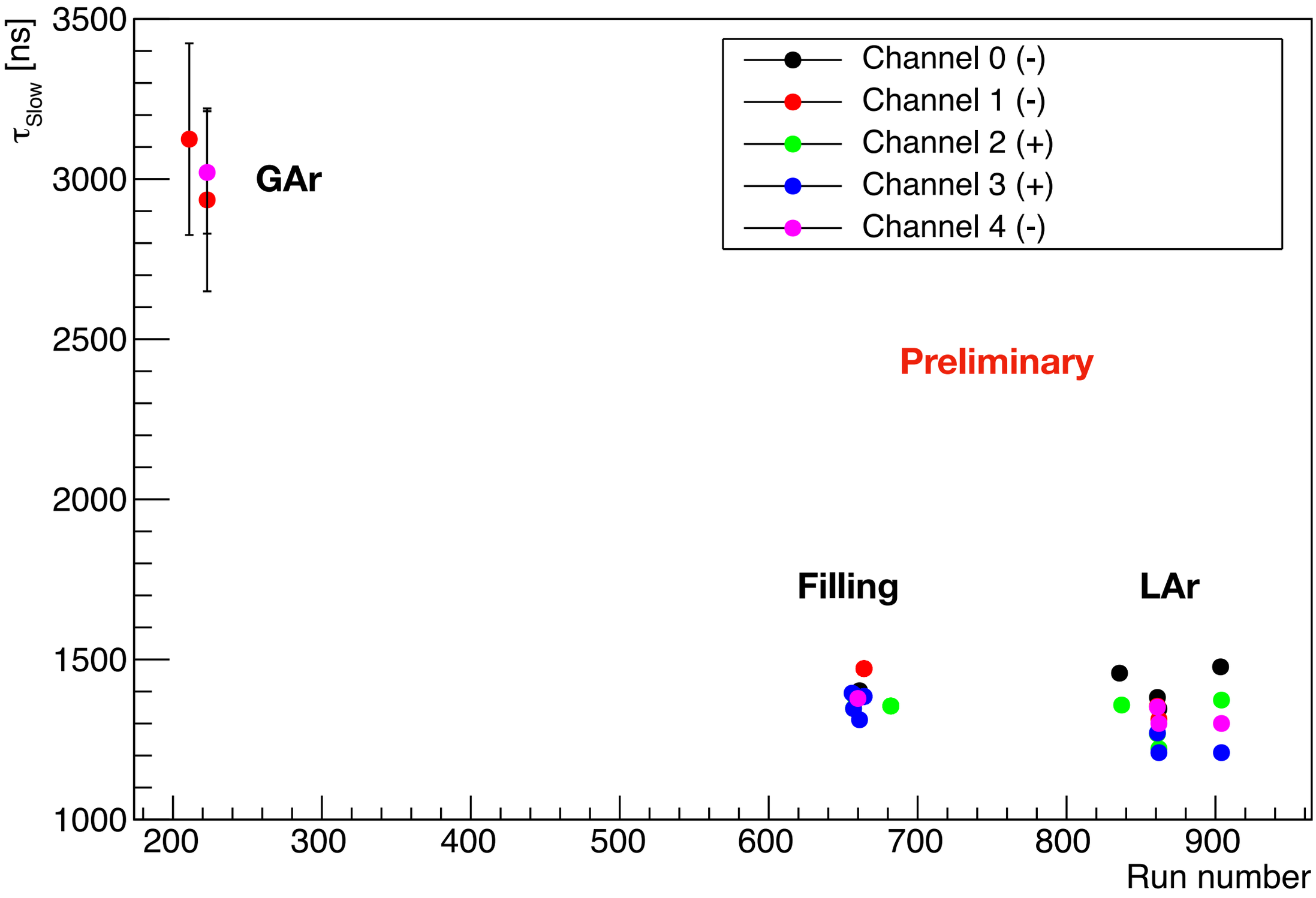
Purity monitoring





The slow scintillation component can be monitored run by run on every PMT

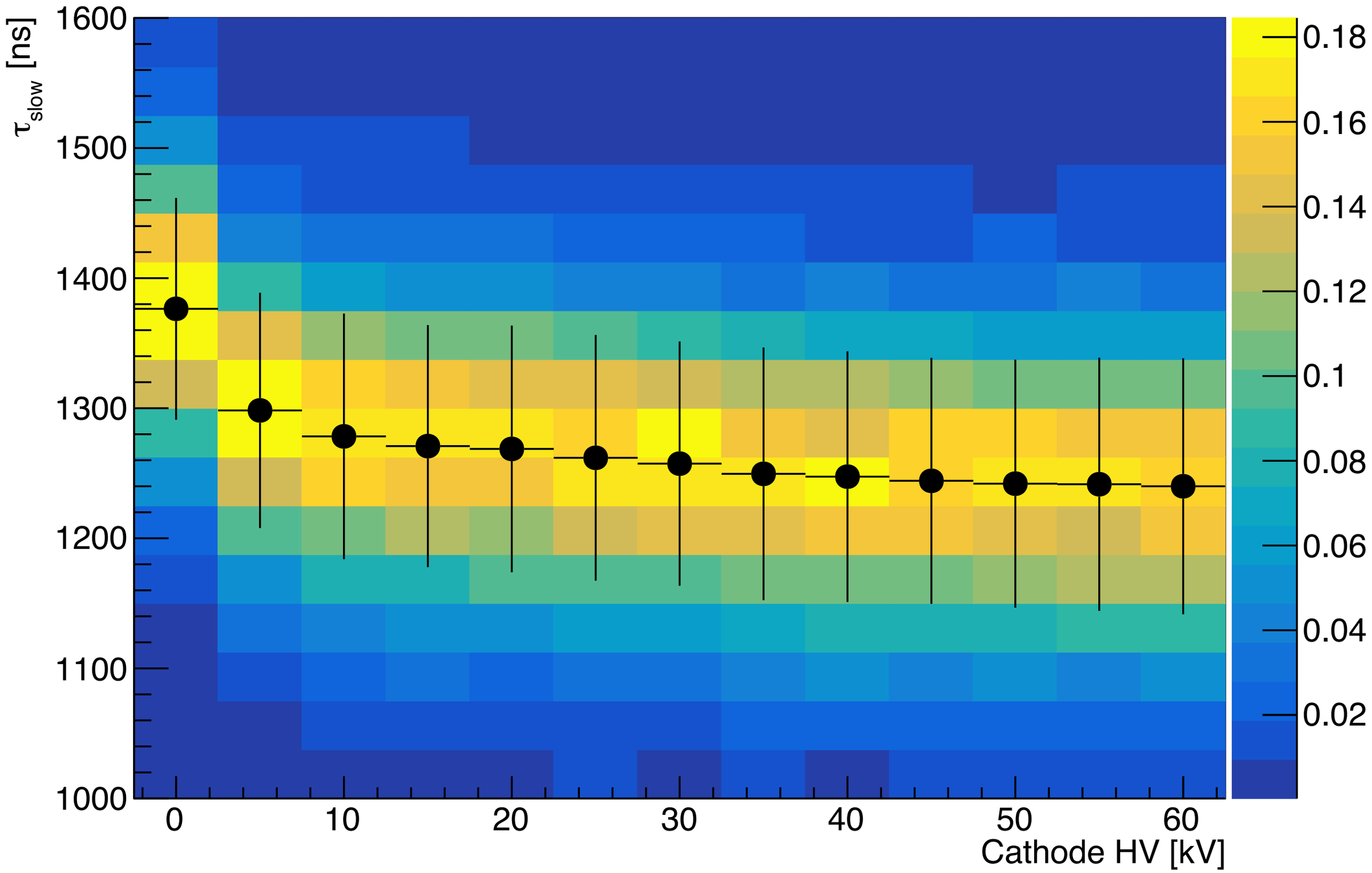
Purity measurement from scintillation light



More runs being processed right now

S1 studies

Scintillation fit τ_{slow}

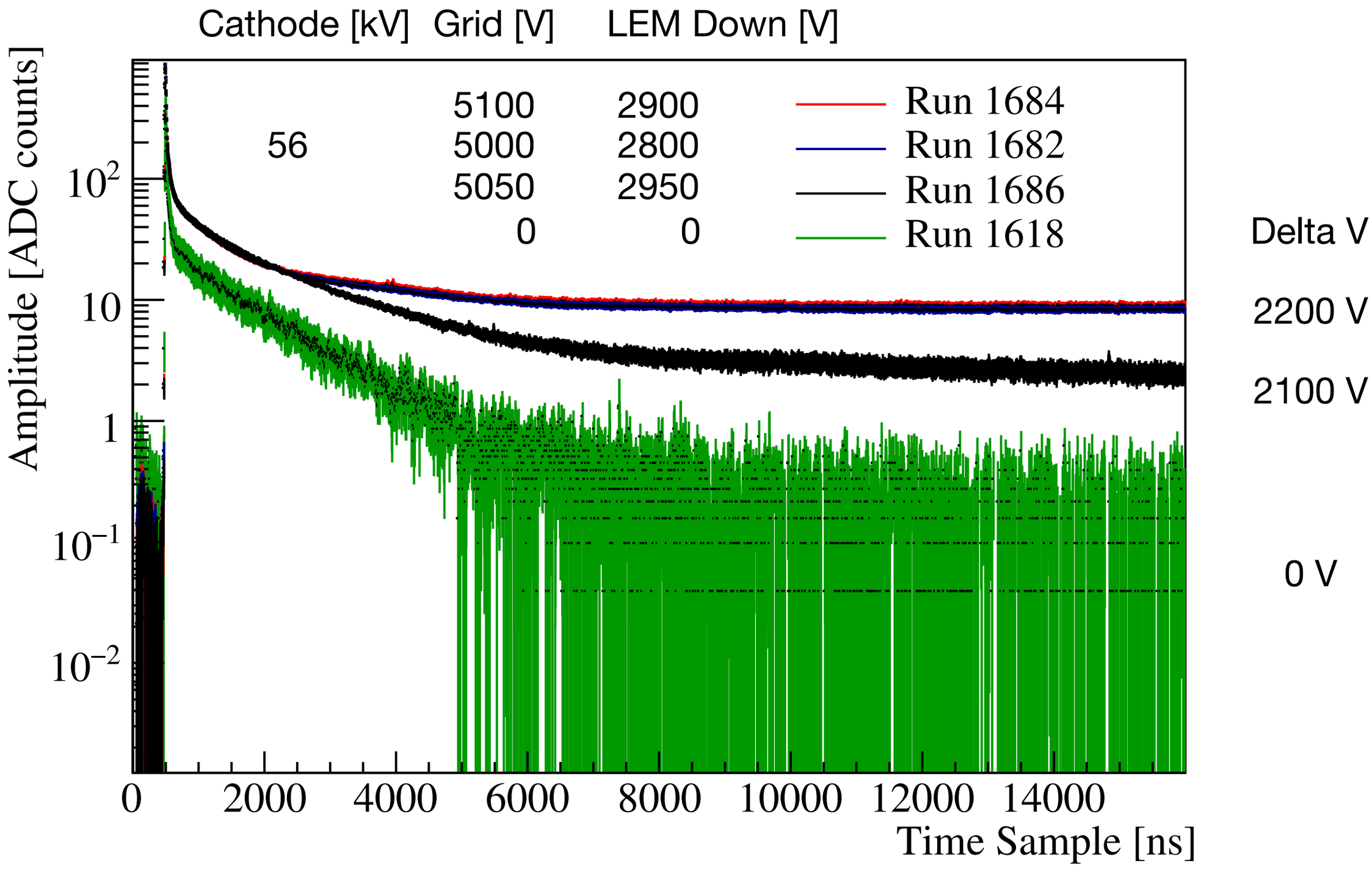


Observe a dependence of the slow scintillation time component w.r.t. the drift field

S2 studies

S1/S2 vs extraction and amplification fields

Anne



Summary

- Data analysis for the 3x1x1 review is ongoing
- Few studies are being proposed:
    - PMT calibration and bases comparisons
    - LAr purity monitoring: scintillation time stability
    - S1 studies: charge, scintillation time
    - S2 studies: charge, S1/S2, drift time
- Thanks to all contributors: Anne, Carlos, Jose, Silvestro