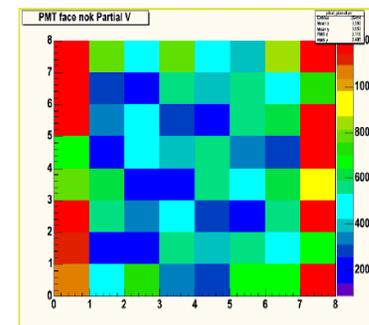


NC Working Group Summary

- Summary of recent work
- Tasks and goals

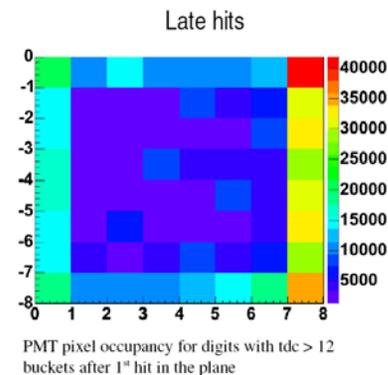
Late Activity

- **Low Pulseheight Events**
 - Instrumentation effects particularly important for NC
 - Niki identified prominence of edge pixels in low pulseheight excess in NearDet data – PMT effect
 - 100ns cut on event duration removes this excess
- **Unknowns:**
 - Is this really PMT effect?
 - Exactly how do these events pass reco?
 - How are otherwise good events effected by whatever mechanism causes low PH excess?
 - What other effects are there?



LI In SGATE

- Rustem, Bill Luebke, et al.
 - Use Light Injection to separate PMT from other effects
 - Afterpulsing lifetime and pixel pattern agree well with afterglow seen in beam data, and effect in low pulseheight event excess



Raw Beam Data

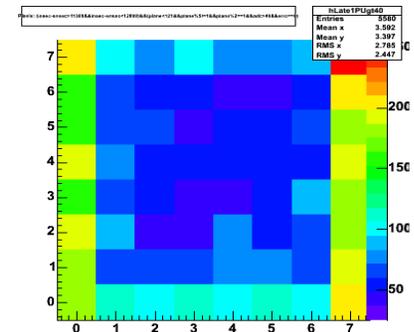
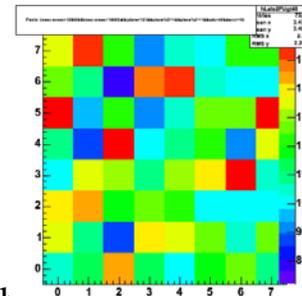
- Raw Beam Data

- P.S. – break beam data into 4 “epochs” in SGATE

- Pre-beam, beam, up to $1.6\mu\text{s}$ after beam, and more than $1.7\mu\text{s}$ after beam

- 1st post-beam epoch shows same pixel pattern as PMT afterpulsing seen in LI

- However, later timescales show late activity with higher pulseheights, and no pixel pattern – neutrons? Muon decay?



Muon Lifetime

- Tom Osiecki
 - Is Muon Decay a significant part of late activity?
 - Measurement is test of NearDet performance
- μ^- lifetime appears to show reduction due to Fe capture
 - μ^+ has background not yet understood. Charge mis-ID?
- Not a significant source of Late Activity

Cuts

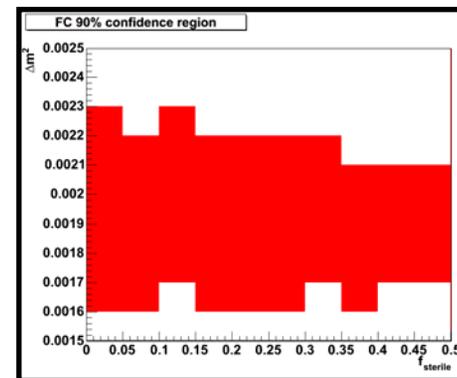
- Duration cut removes much of low pulseheight event excess
- So does previous activity cut
- Need to understand
 - How does previous activity affect otherwise good events?
 - What (rate dependent) bias is introduced by any such cut?
 - Model in MC

Data/MC

- **Niki – ANN selection, ND Data/MC**
 - Remarkably good comparison for all 3 beam configurations at this stage.
 - Preliminary calibrations
- **Phill – 1st look at FarDet Data/MC**
 - “Nothing Crazy” in the data
- **Low Level noise at FD – Justin Evans**
 - Low-level study of noise in FD Spill triggers.
 - At raw level, noise is overwhelming below ~ 0.5 GeV, but reconstruction and topological selections will improve this
 - Useful input to MC simulation or MC overlay studies.

Fitting

- **Marquardt – Brian**
 - Input gradients of data with respect to systematic parameters into fit function
- **Feldman-Cousins – Tobi**
 - (Very) Preliminary tests with MDC:
 Δm^2 vs. f_s
- **Alysia – Combined NC/CC**
 - SNO like fit, to Likelihood decomposition of NC and CC, without a selection cut



Tasks

- **ToDo list from May 13, 2005**

Plans for/before Ely

- A) Low energy blobs / blobs / instrumentation effects
- B) Low energy blobs in low intensity
- C) LI in s-gate - afterpulsing
- D) FD - Trigger threshold
- E) ND Shower reconstruction issues / energy resolution
- F) MC comparison
- G) FD / ND calibration impact on the NC analysis
- H) 5-year plan - how sensitive will we be?
- I) When will we "recommend to open the box"? (sensitivity vs pots)
- J) FD / ND calibration impact on the NC analysis
- K) More elaborate dm2-fs-ft fitting (too early?)

Much progress Some Progress Groundwork

Updated Task list

- A) Low energy blobs / blobs / instrumentation effects
 - Make cut variables available in Ntuples
- B) Low energy blobs in low intensity
- C) LI in s-gate - afterpulsing
- D) FD - Trigger threshold
- E) ND Shower reconstruction issues / energy resolution
- F) MC comparison
- G) Interface with Batch Processing
- H) Common Analysis Framework
- I) FD / ND calibration impact on the NC analysis
- J) 5-year plan - how sensitive will we be?
- K) When will we "recommend to open the box"? (sensitivity vs pots)
- L) FD / ND calibration impact on the NC analysis
- M) More elaborate dm2-fs-ft fitting (too early?)
- N) Blessed plots

a