TPC Peak Fit t_0/<t> Correction

Jonathan Paley
Indiana University

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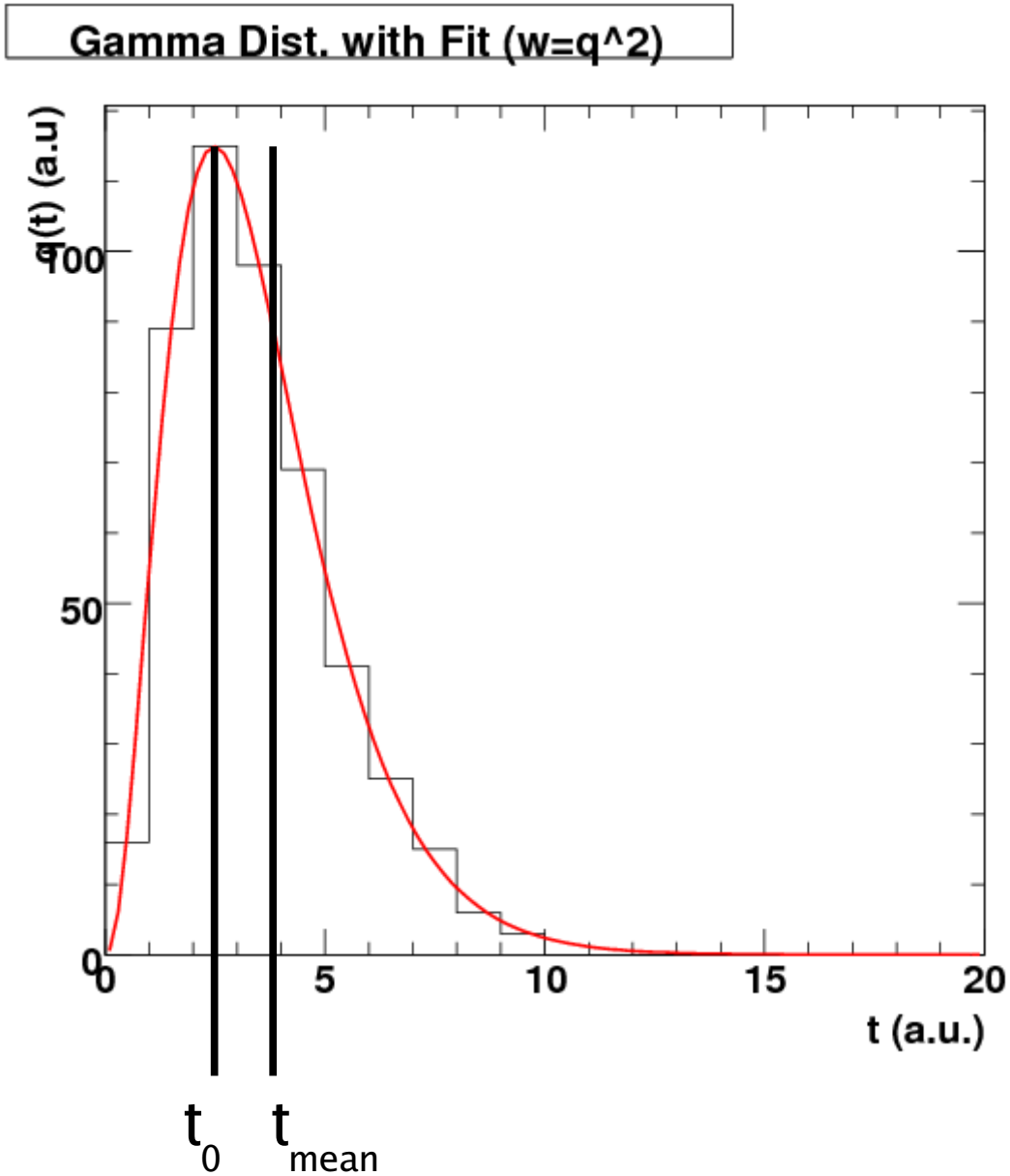
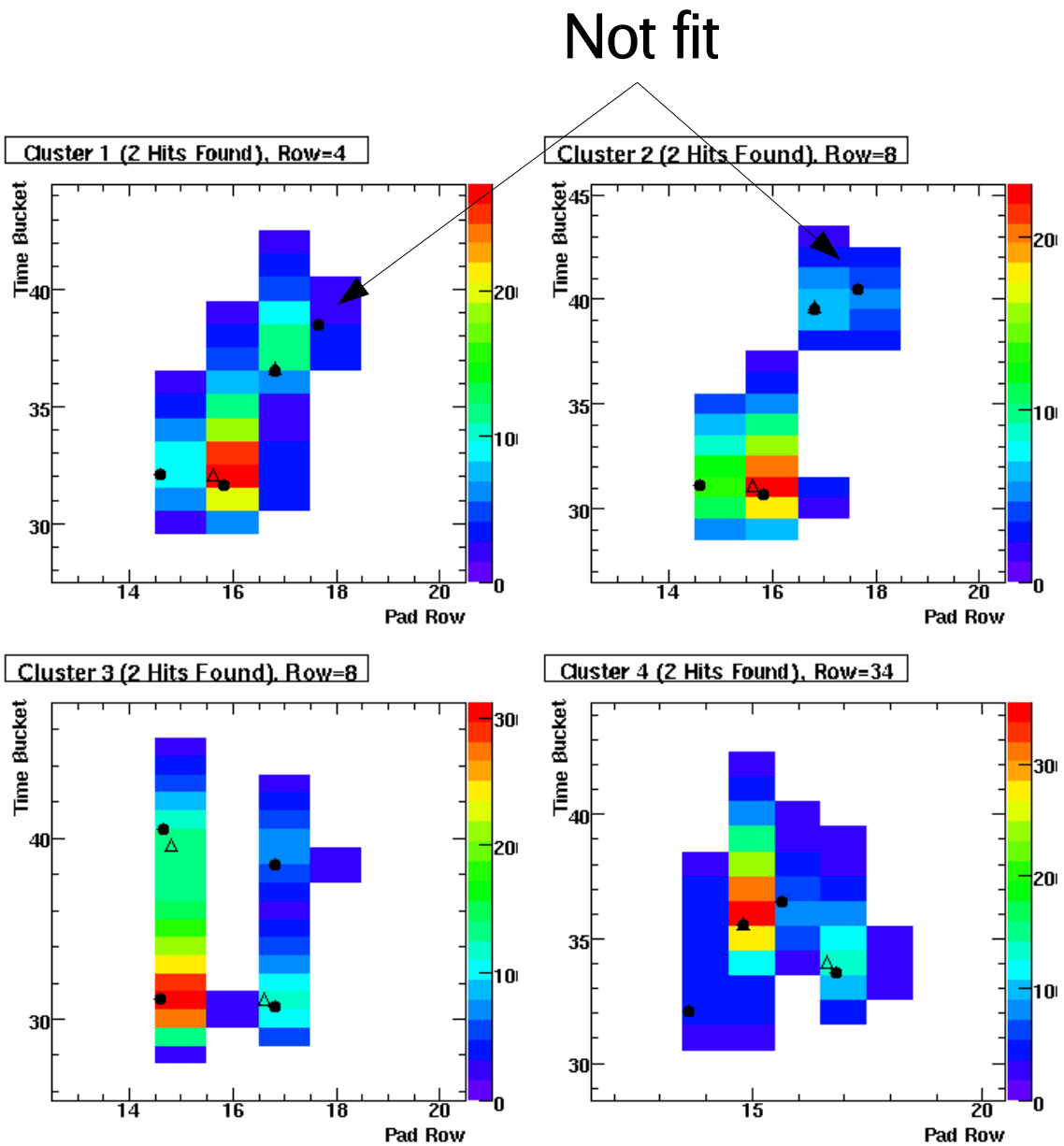
How TPC Hits are Formed

- Remember that contiguous TPC digits (voxels) are grouped together in each pad row to form 2D clusters.
- Peaks in each pad are then found and the time associated to each peak is used to determine the average time and x-position of the TPC hit.
- The associated time for each peak come from either the t0 of a fitted Gamma function, or from a weighted mean if the fit failed or was impossible.



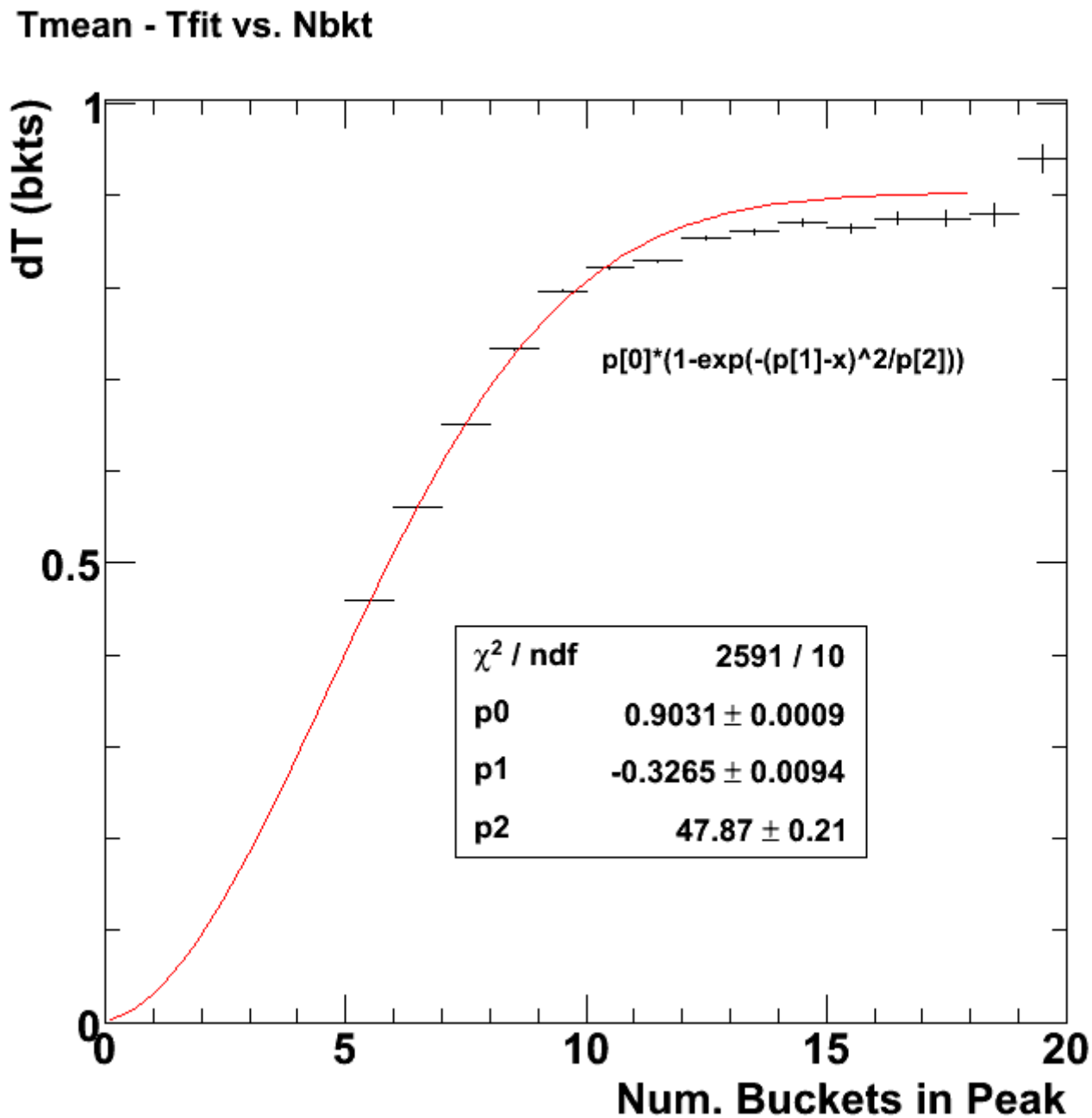
How TPC Hits are Formed (2)

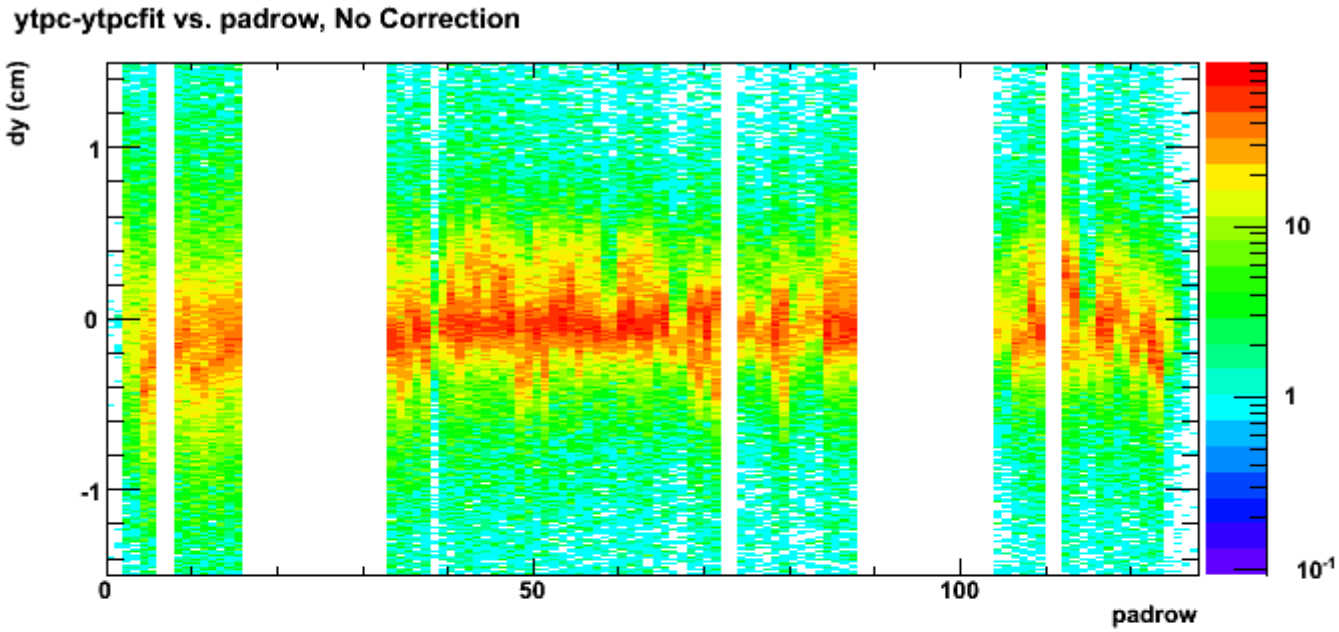
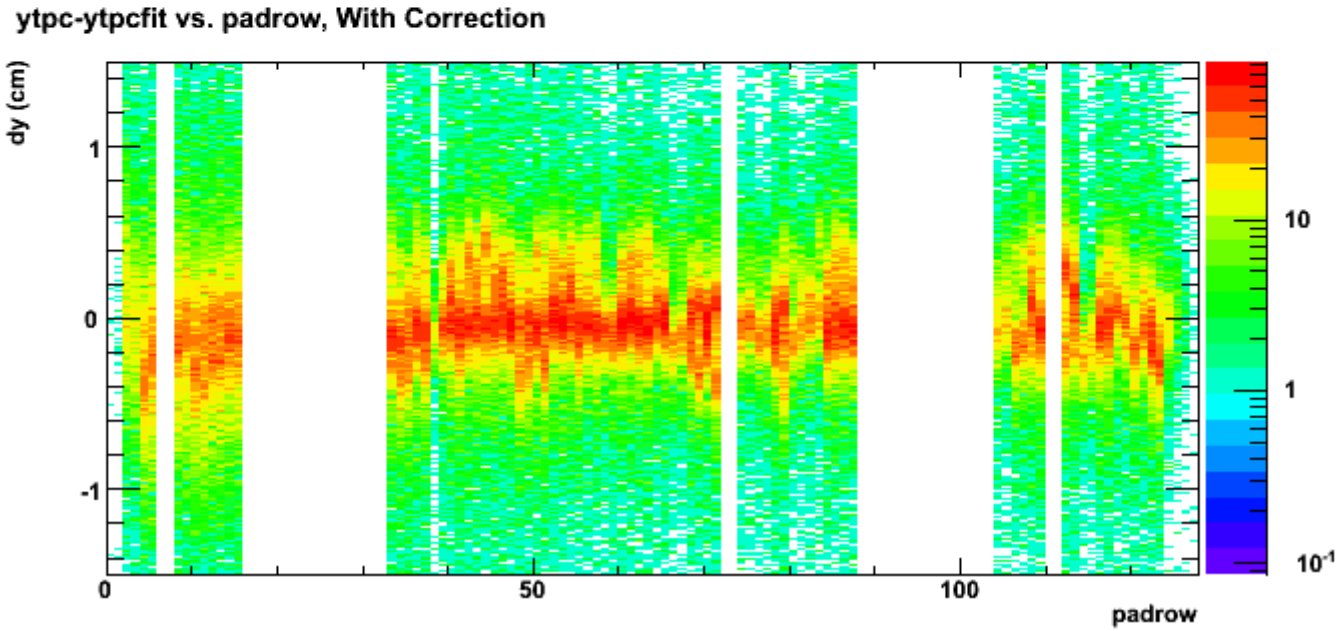
- When calculating the centroid of the hit, fitted t_0's receive a weight of 1 and t_{mean}'s receive a weight of 0.1.
- At the time when we first implemented the TPC hit fits, it was decided that we would come back and revisit the effect of using t_0's and t_{mean}'s in the same hit.
- The global track fits are now at a point where we can see this effect, so we are now revisiting this issue.



Measurement of $t_{mean} - t_0$

- The plot on the right shows the <dt> as a function of number of buckets in the peak, *for all pads*.
- Note that only peaks with 5 buckets are fit.
- Fit function is not perfect, but is pretty good where most of our data is (5-9 buckets).



Results of Correction

- This correction is now applied to all peaks that are not fit.
- As we see in the plot on the right, this correction has not had a huge impact on the track fit residuals.
- We will leave this correction in, since it is the right thing to do.