

MuCap 11/12/2008:
A comparison of the nEHcont.
Y distribution effect in muon
stops and the drift-plane
pulse-width effect in the
capture recoil pulses.

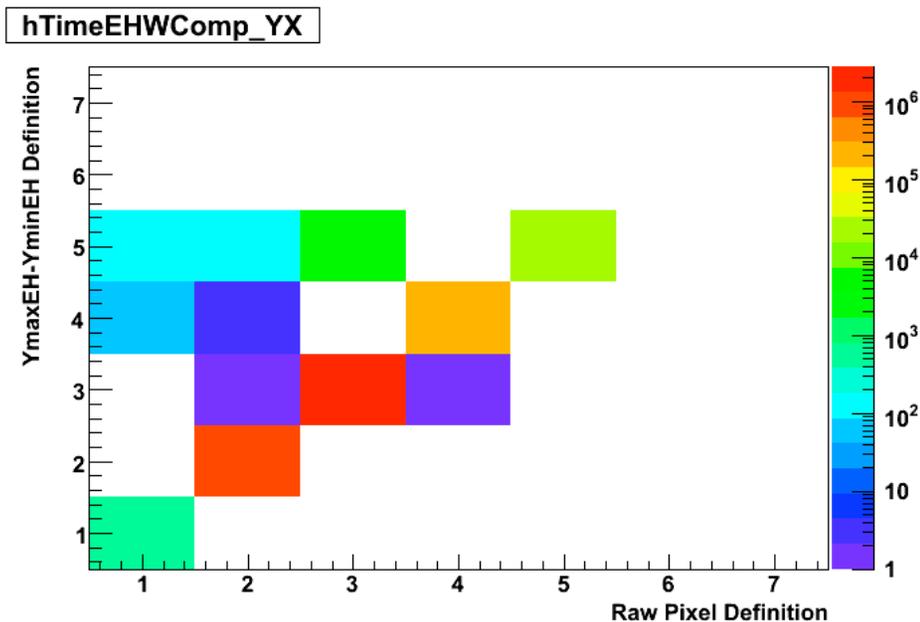
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A response to Brendan's model in the context of the capture recoils

There are several reasons the model Brendan has proposed to resolve the muon stop Y distribution variations vs. the number of continuous EH pixels are likely not to apply very directly to the recoil captures.

While a model of pixels probabilistically going below the EH threshold is effective for the muon stop case the capture recoils (and the muon stop Y distribution effect I observe vs. the Drift-plane pulse-width of the captures) are fundamentally different in a few ways.

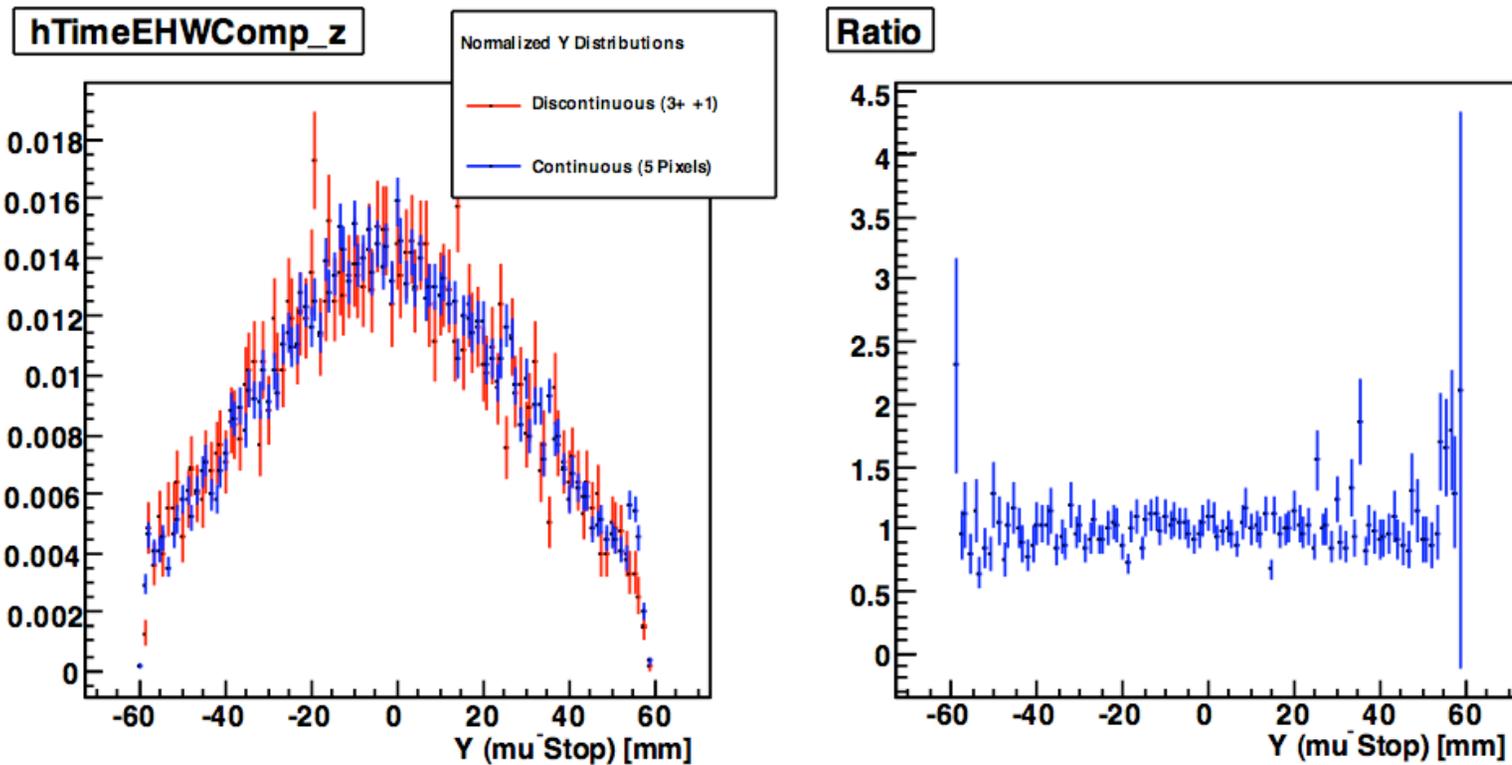
1. The captures show discontinuity in Y relatively rarely, at the level of a %.



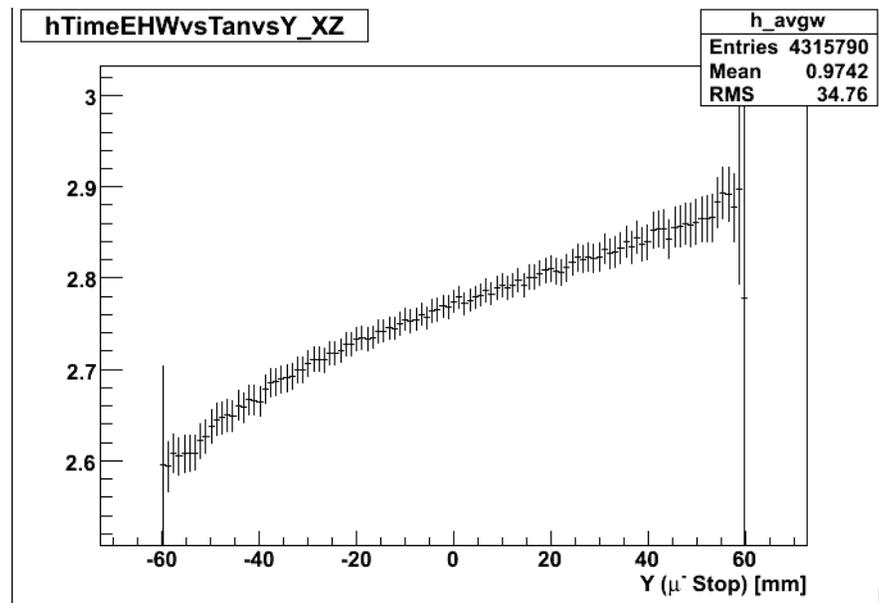
Since the model which works effectively for the muon stops indicates this as a main cause, then the same effect is going to be much weaker in the captures than in the muon stops themselves.

A capture-recoil pulse is a higher energy (EVH) pulse, observed mostly on a single anode. (A considerable minority of events show EH threshold levels on two anodes.)

A comparison of events which have 1 discontinuous pixel.



2: If I understand correctly, the average pulse width effect vs. the Y of the muon stop is actually in inverse in these two effects.



In the captures the longer pulses (length as defined in the drift-plane) come disproportionately from the top part of the TPC. The model being used for the nEHcont effect would predict a shortening of the average pulse length of the captures, meaning longer pulses would be more likely to originate a lower in the TPC.

The capture drift-plane pulse-width effect is more consistent with some form of diffusion or lengthening of the pulse.

3: The drift-plane pulse-width effect in the capture recoil pulses seems to not be monotononic. The very longest pulses have a distribution similar to the overall distribution. The nEHcont effect, if I recall correctly, shows the distribution diverging monotonically with nEHcont.

