TOF Energy Calibration

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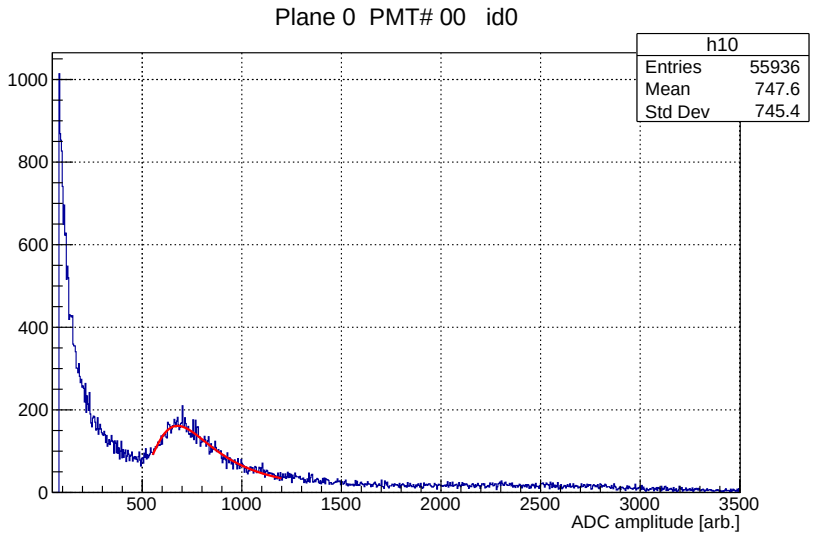
Energy Calibration

Steps towards a propoer energy calibration:

1. Determine MPV of Landau as a function of position along the paddle
2. Code developed using Amplitude and Integral as a function of left/right time difference



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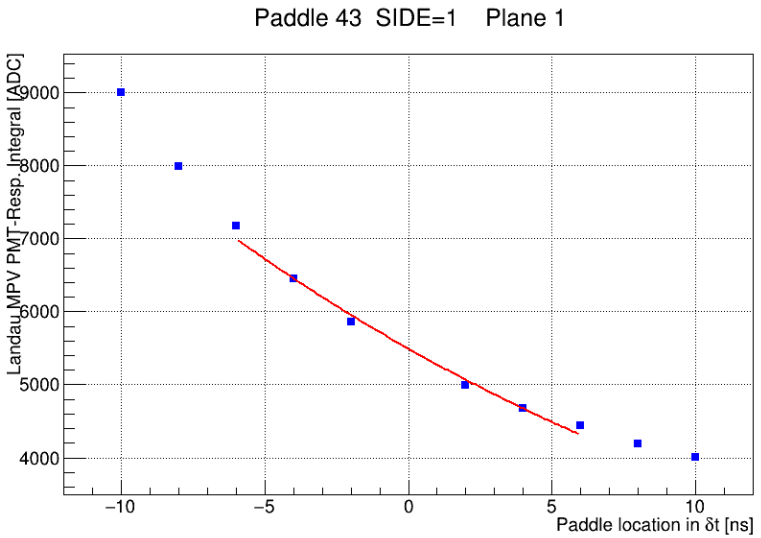
3. Fit attenuation function to data and determine PMT response at center of paddle.



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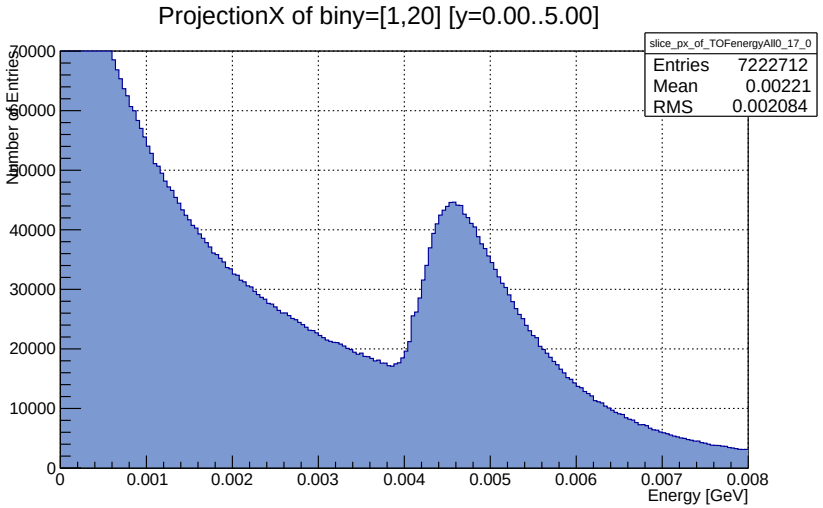

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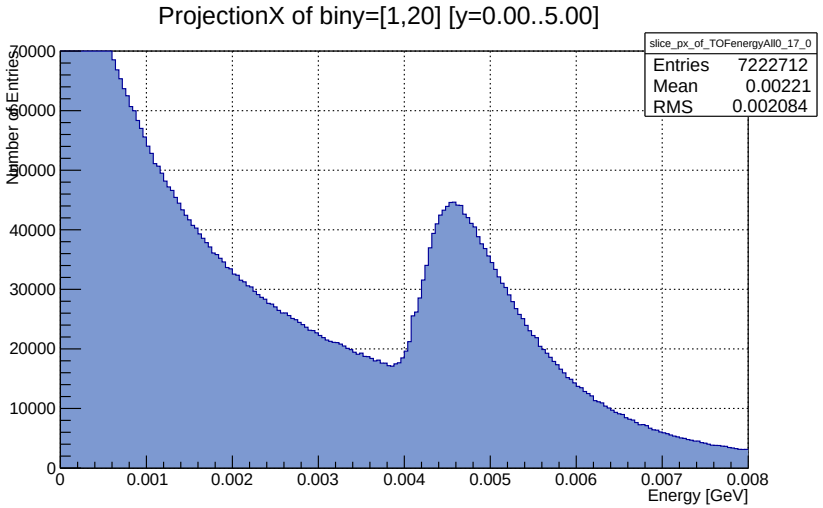
6. Create ADC to Energy factors for each paddle, using results from Integrals.



Implementation

What is currently in the code:

1. In DTOFHit Factory: ADC to energy conversion dE: = Integral*adc2E[idx]
2. Individual conversion factor for each PMT
3. In DTOFPaddle Factory: Apply attenuation factor and average energy for paddle: $dE = (E_{north} * attenN + E_{south} * attenS)/2$.
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How to Proceed:

1. Use current implementation as much as possible but fix some bugs and improve
2. Use Integrals to determine PMT resonse and conversion factors ADC to Energy
3. Make the center of the paddle the reference for PMT response.
4. Independed numbers for energy deposit in the two planes separately rather than one average value: may improve PID

And....

- Currently two attenuation lengths are implemented but fixed to be the same for all: 70cm and 400cm
- Try to use half paddle energy depsition in DTOFPoint?
- .....what do I forget?

suggestions, ideas, what else, ?