
uTPC plans



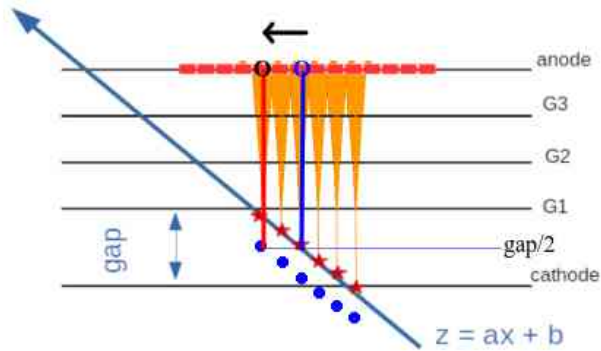
Time calibrations

Time reference

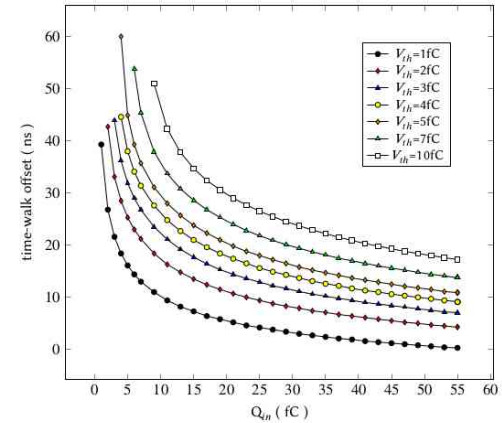
$$t'_{hit} = t_{hit} - t_0$$

$$z_{hit} = t'_{hit} \cdot v_{drift}$$

$$x_{\mu\text{TPC}} = \frac{\text{gap}/2 - b}{a}$$



Time walk



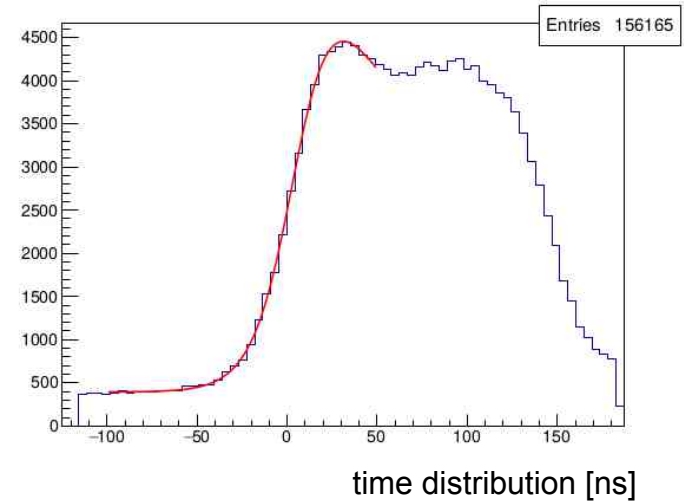
Time calibrations

Time-walk is the first calibration to be implemented because the time reference depends on the time measurement then on the time-walk

Time walk → Time measurements → Time reference

The time-walk corrections can be performed in two ways:

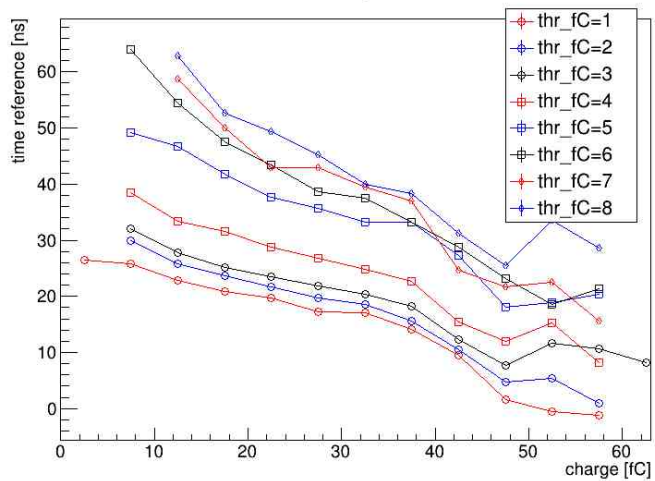
- 1 - from simulation (i.e. the curves of the previous slide)
- 2 - from data (measuring the time reference for each charge and threshold)



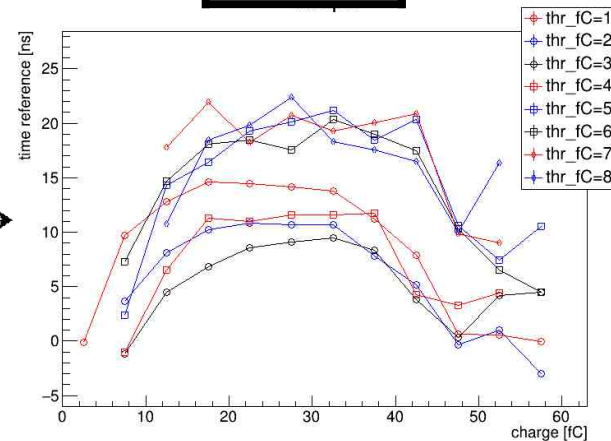
Time-walk

AFTER

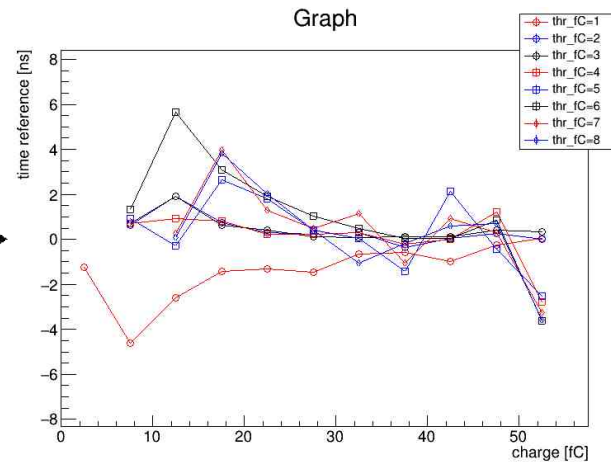
BEFORE



simulation



data

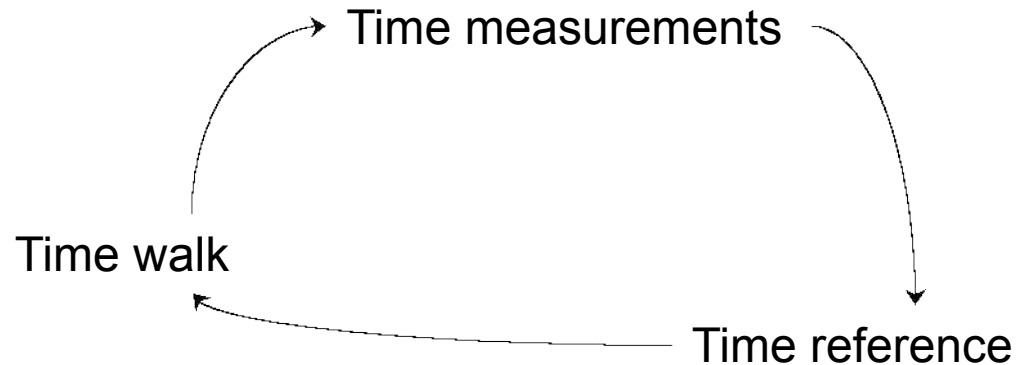


Time calibrations

Time-walk corrections from data-driven studies make flat the correlation between time and charge but they might be affected by bias (to be discussed).

Time-walk corrections from simulations would be better if we had a good simulation. This is not the case.

The proposal is to study the time-walk corrections from data, then to study the time reference values channel by channel. The correction may interfere with each other then an iterative procedure is needed.

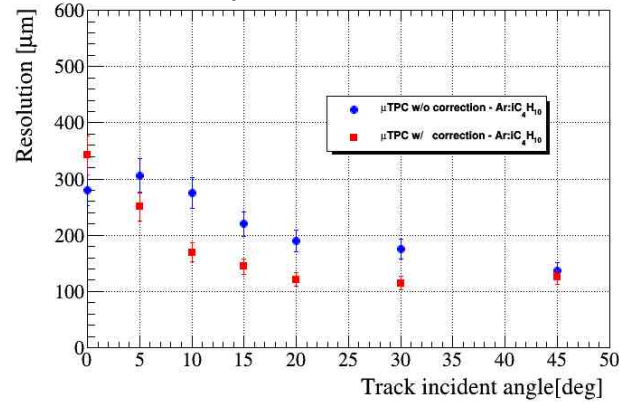


After calibrations

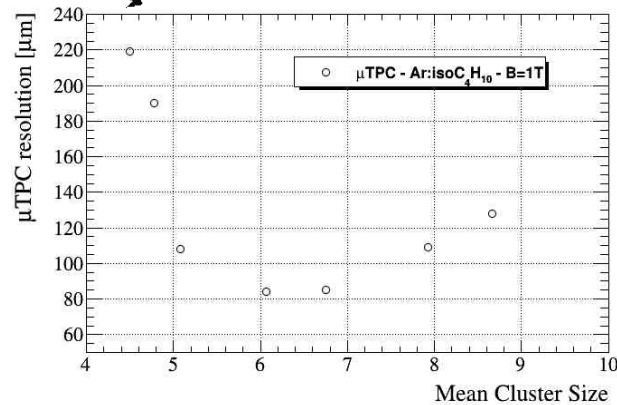
After the calibration, other optimizations are needed. Here a list of sources that would improve the μ TPC resolution.

- 1 - capacitive correction
- 2 - broken cluster (a larger cluster size would improve the performance)
- 3 - tracking (there is a dependency on the tracking χ^2)

planar R&D



planar R&D



CGEM cosmic

