Tofprad @ CNAO2024

Setup

Tofprad

Edge function vs gap thickness
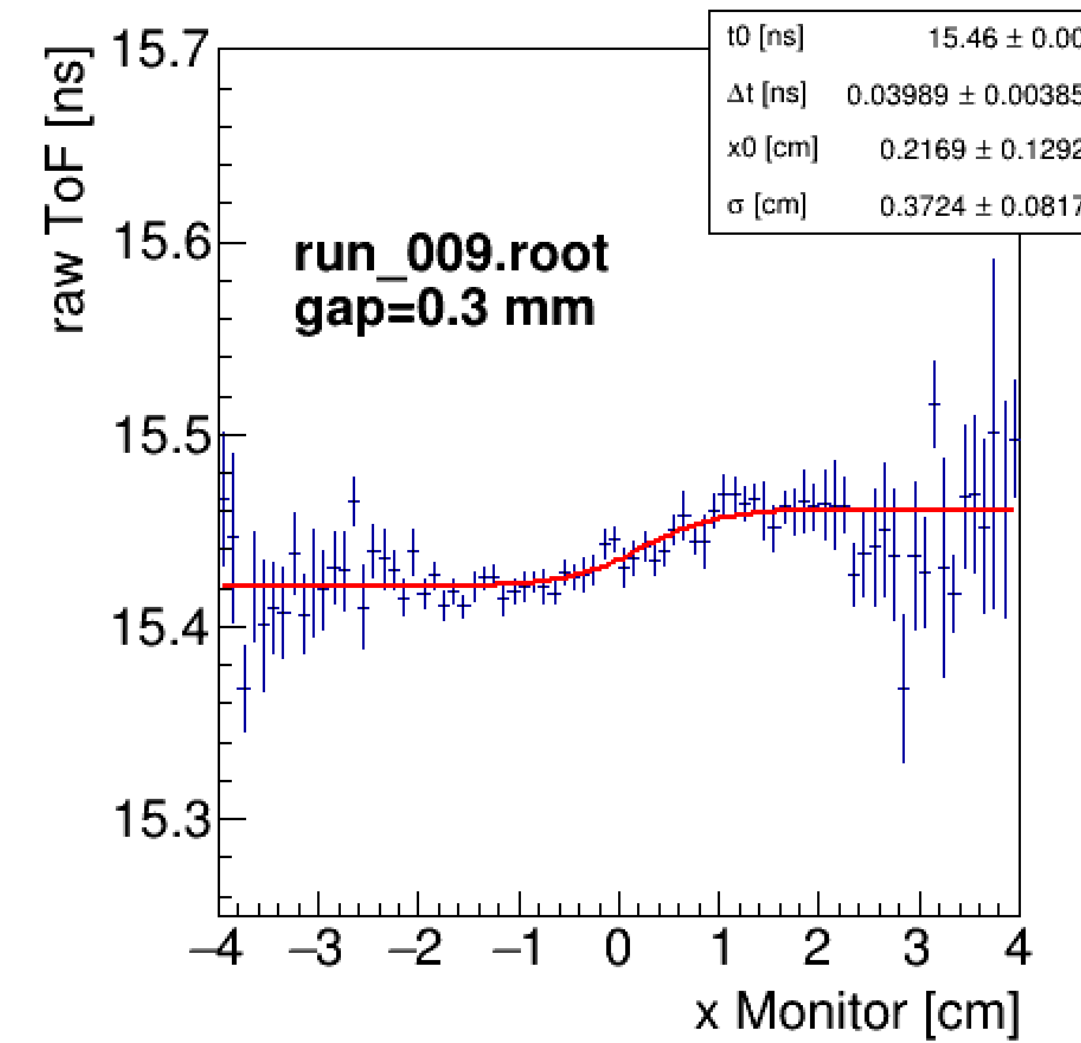
STCharge>0.05
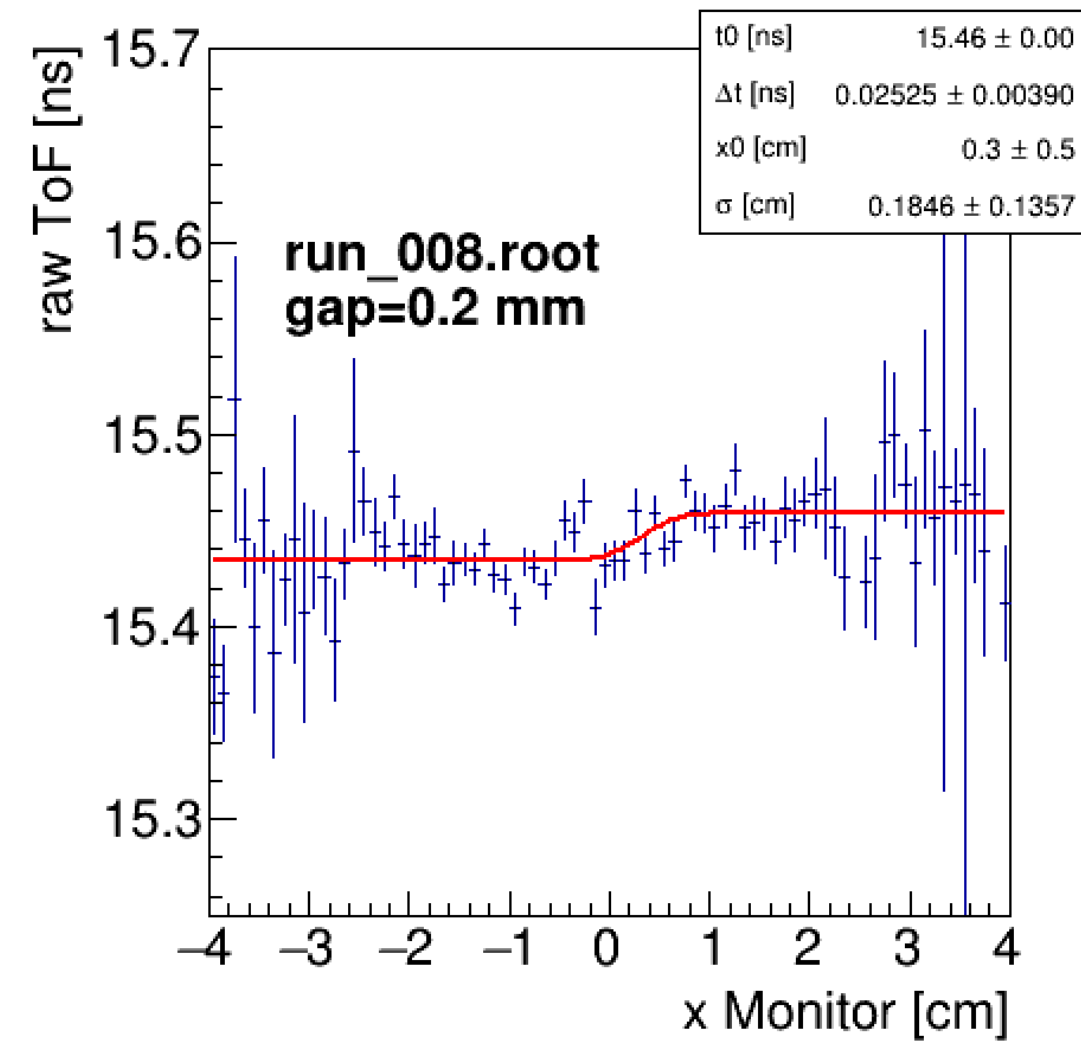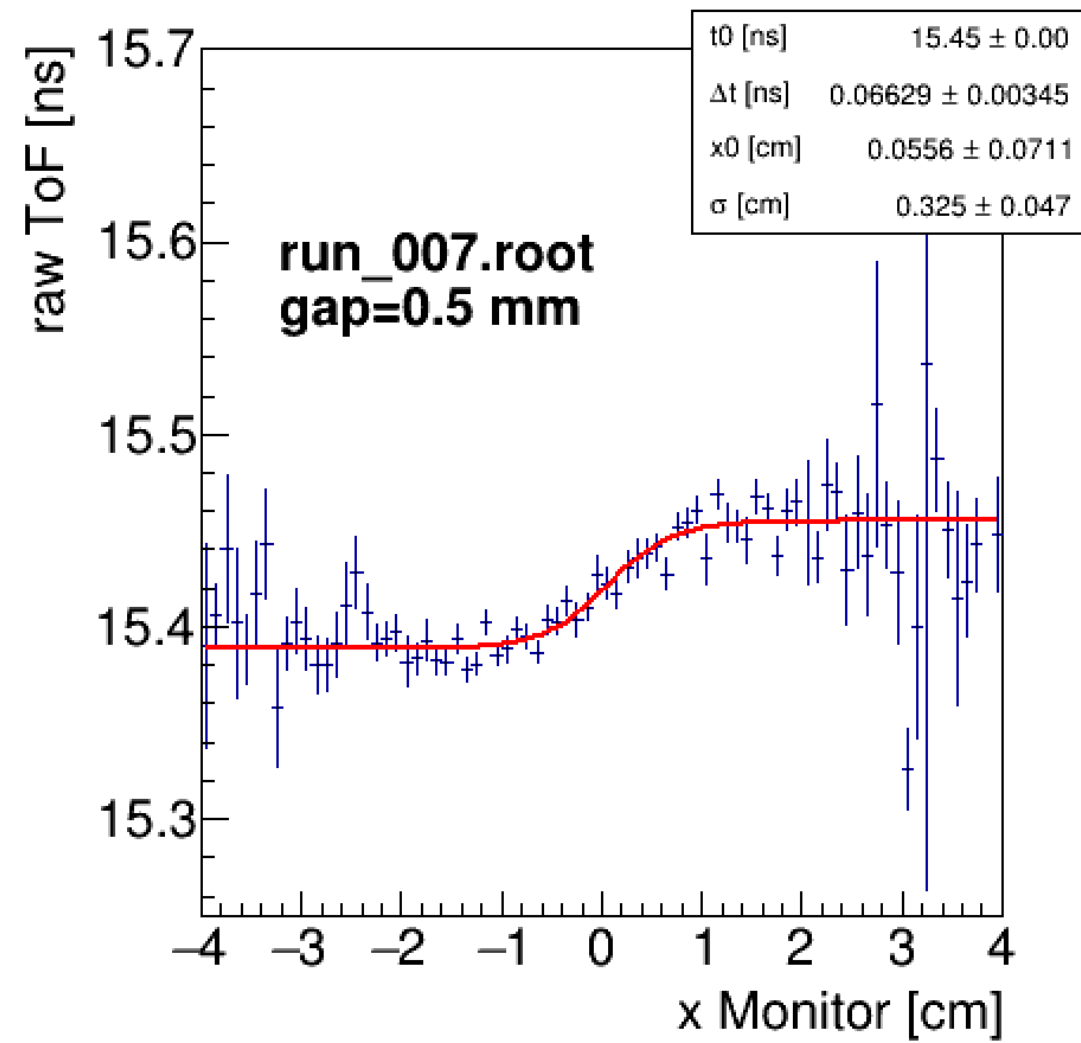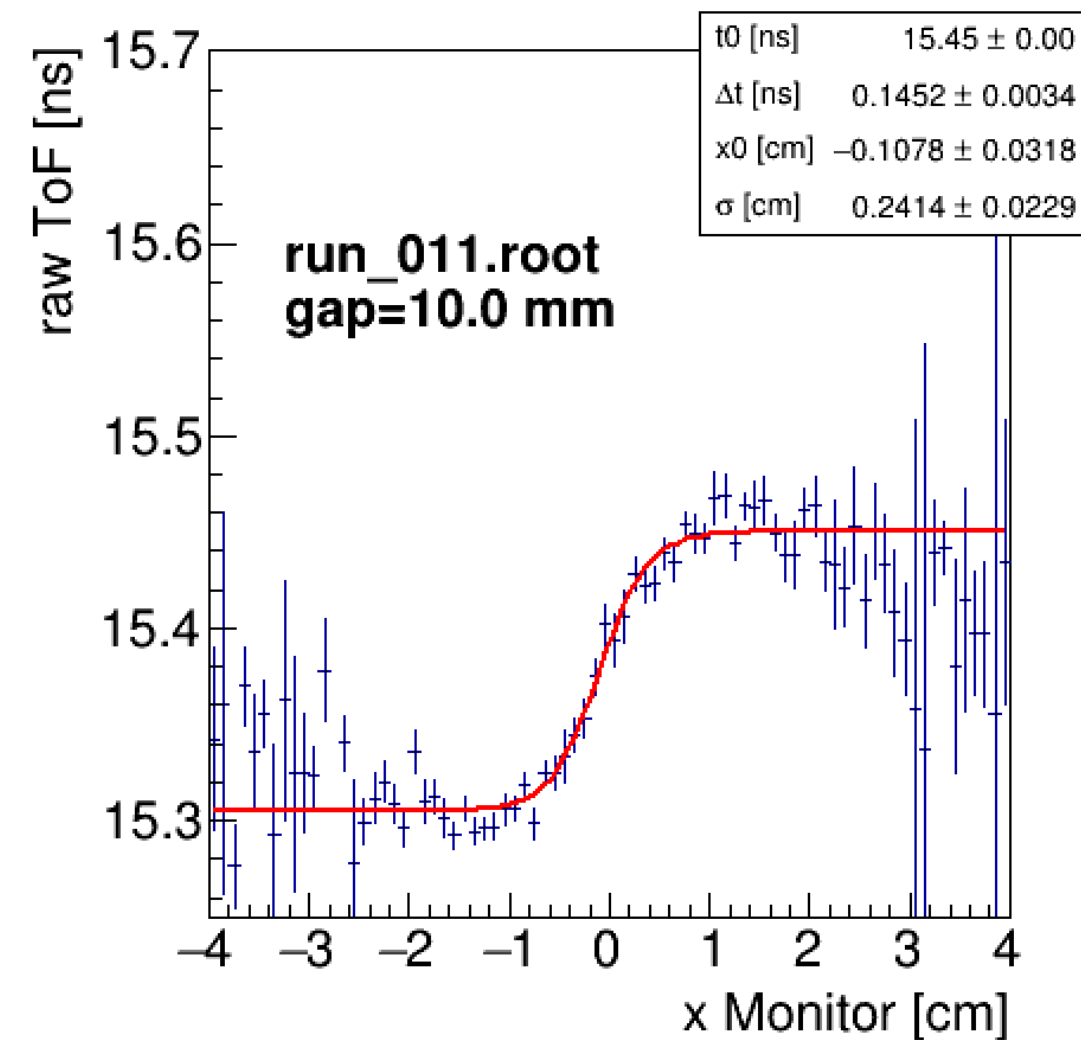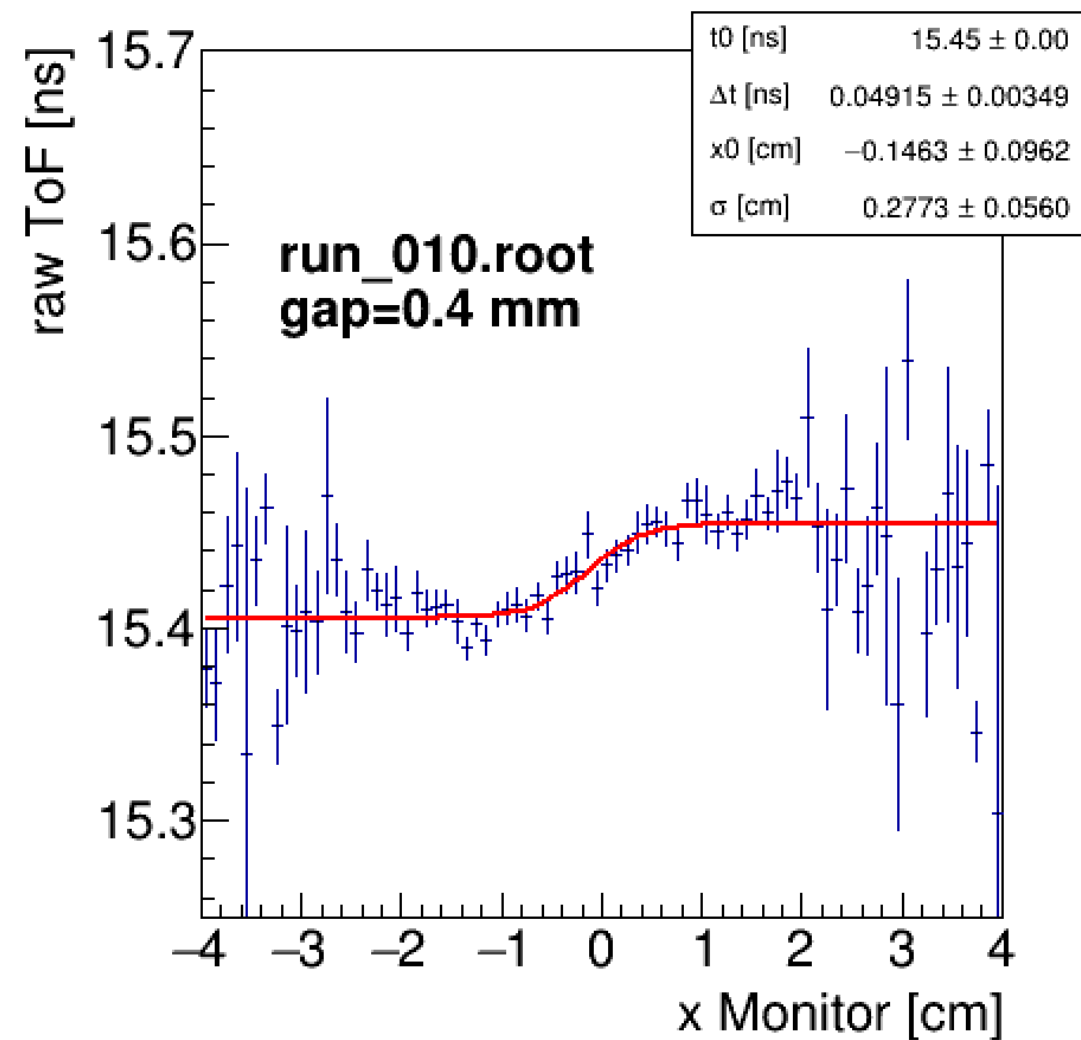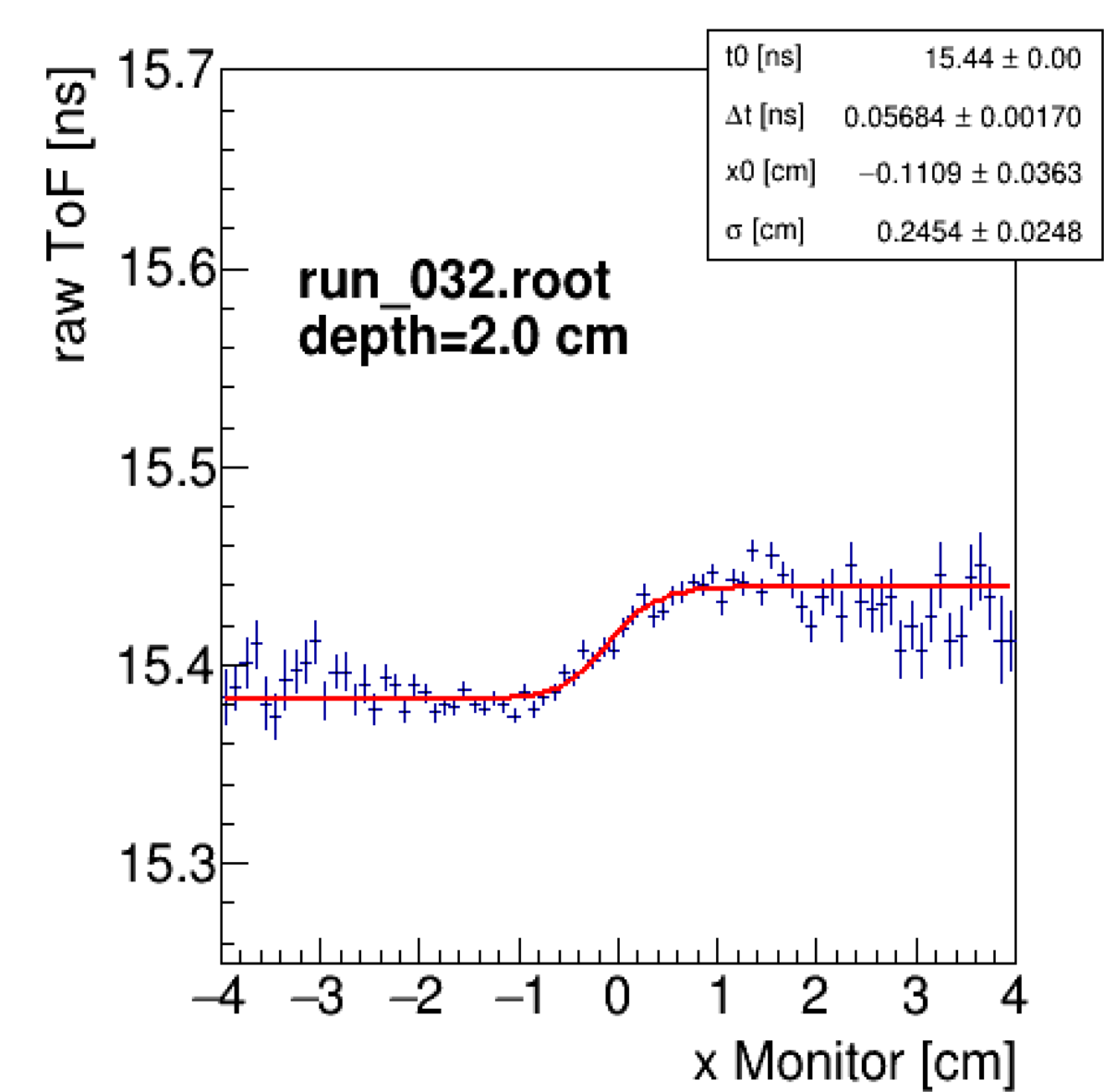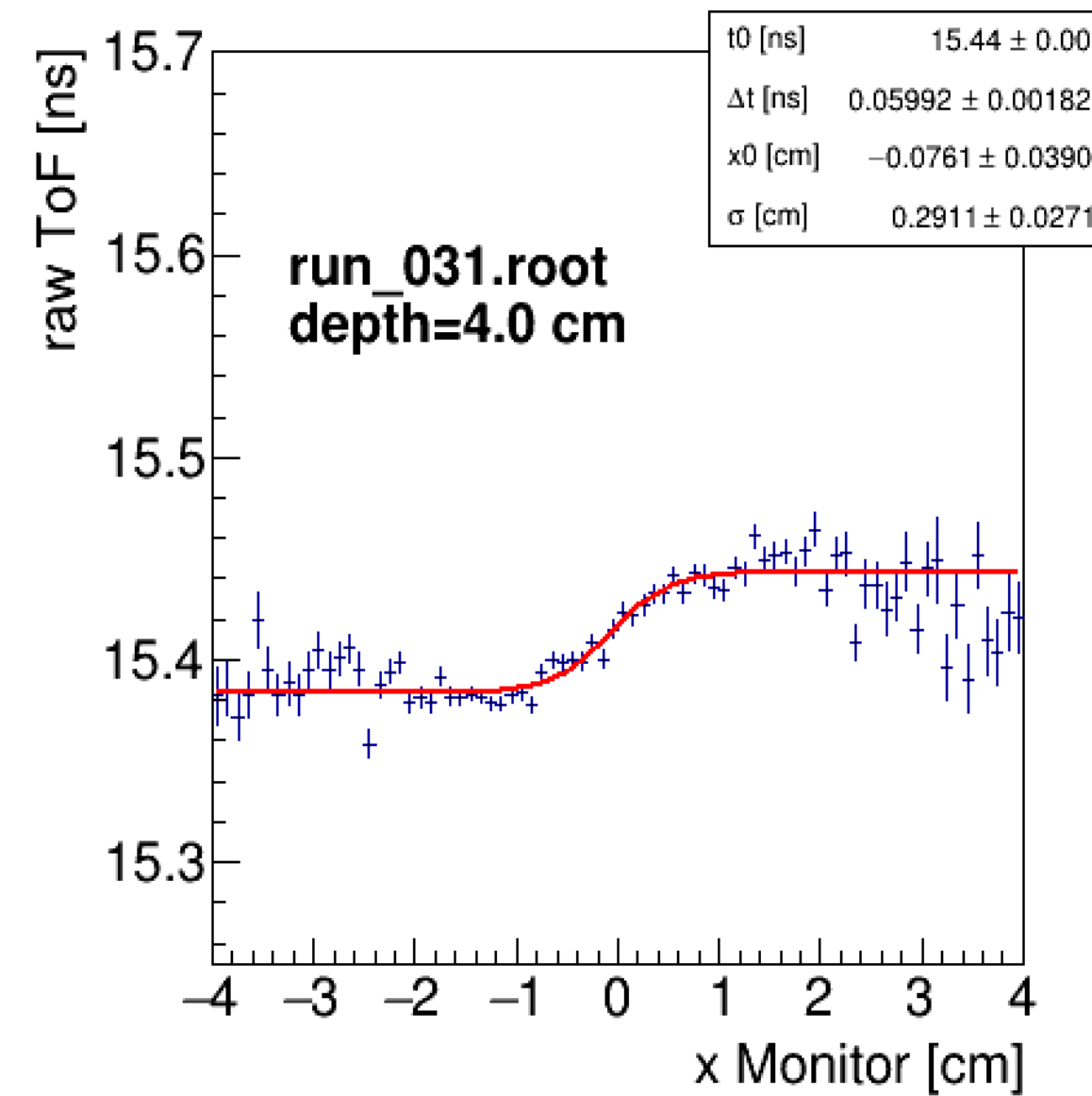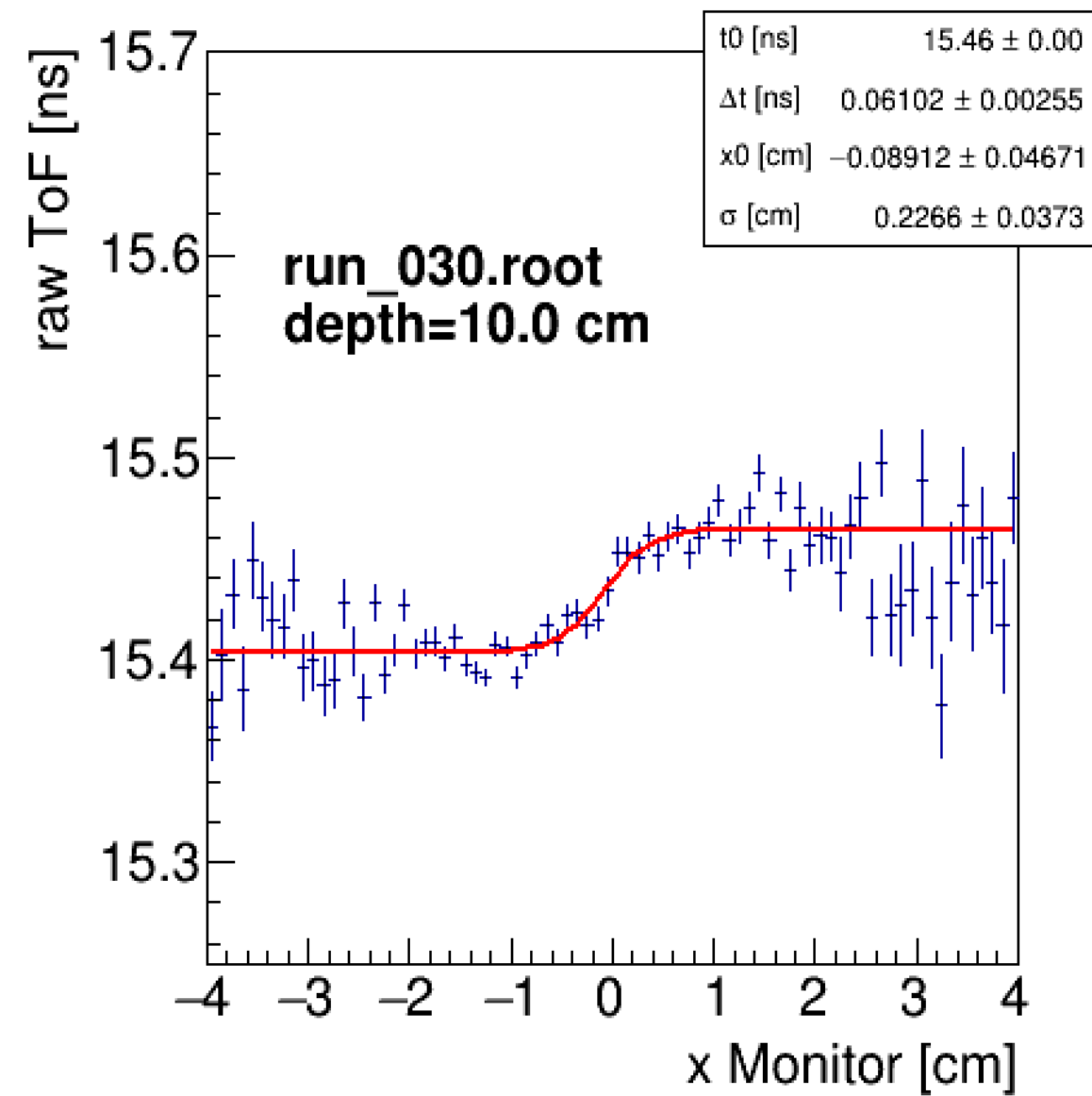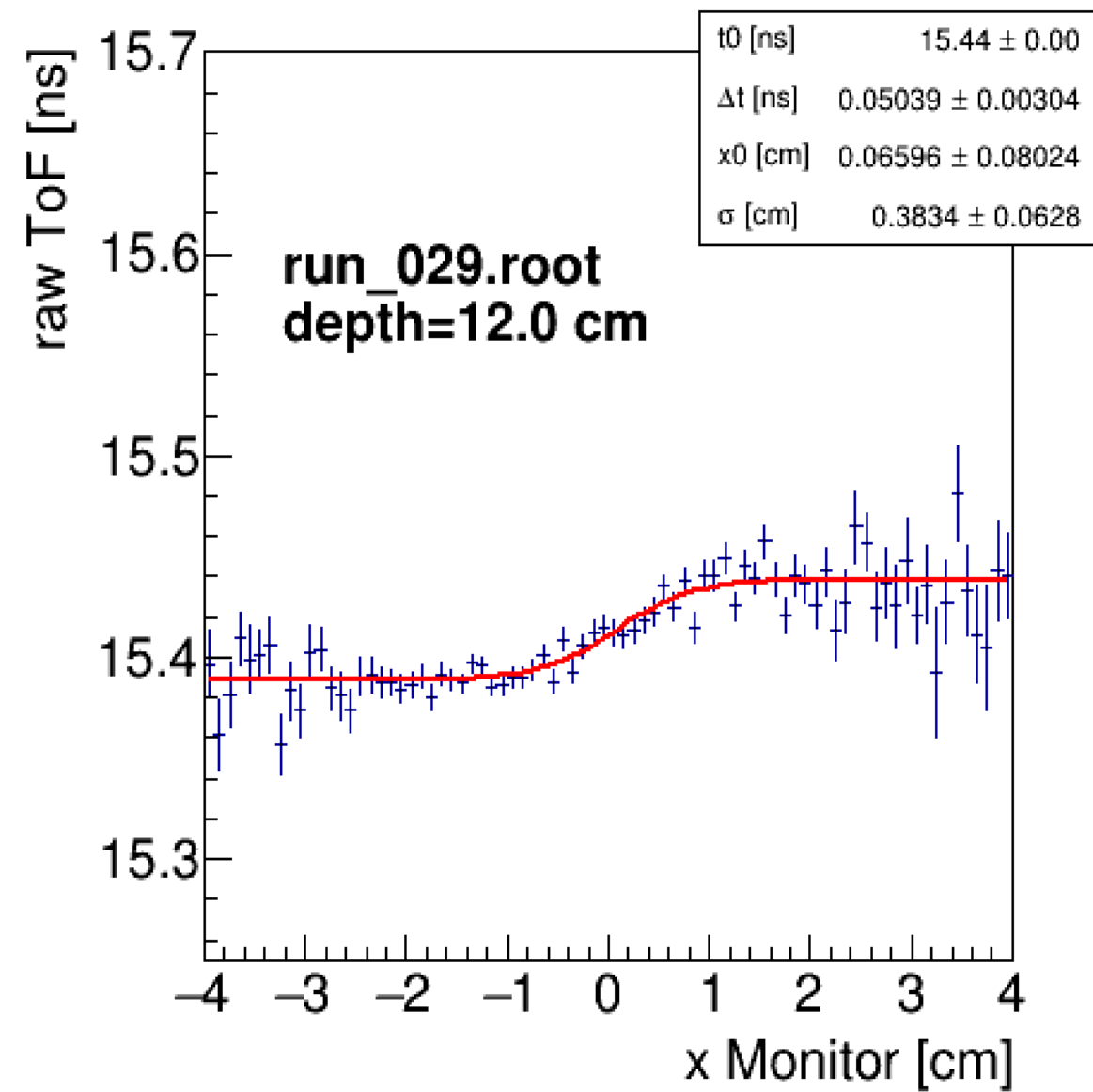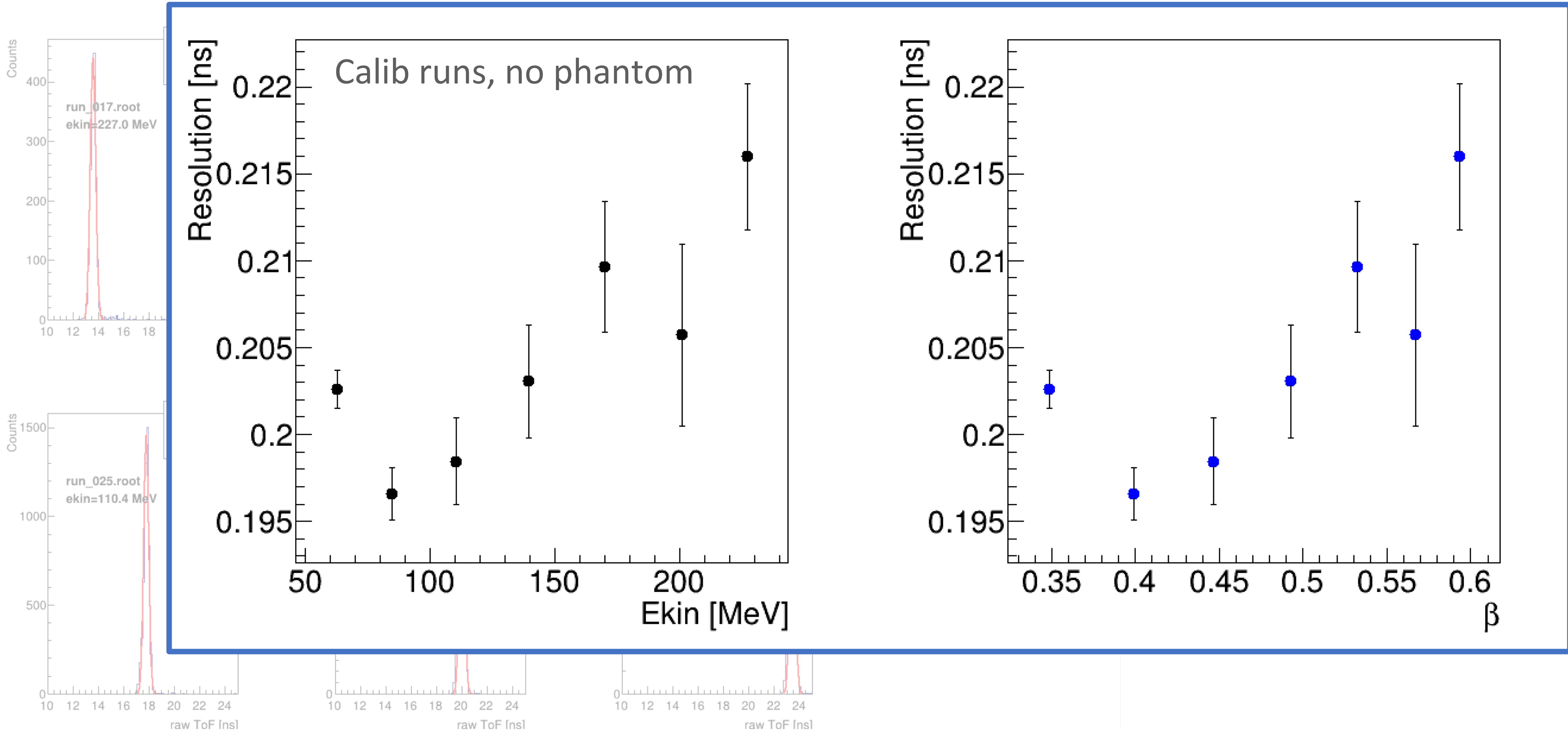TWCharge>0.05

$$f(x) = t_0 - \Delta t \left(1 - \frac{1}{1 + e^{-\frac{x - x_0}{\sigma}}} \right)$$
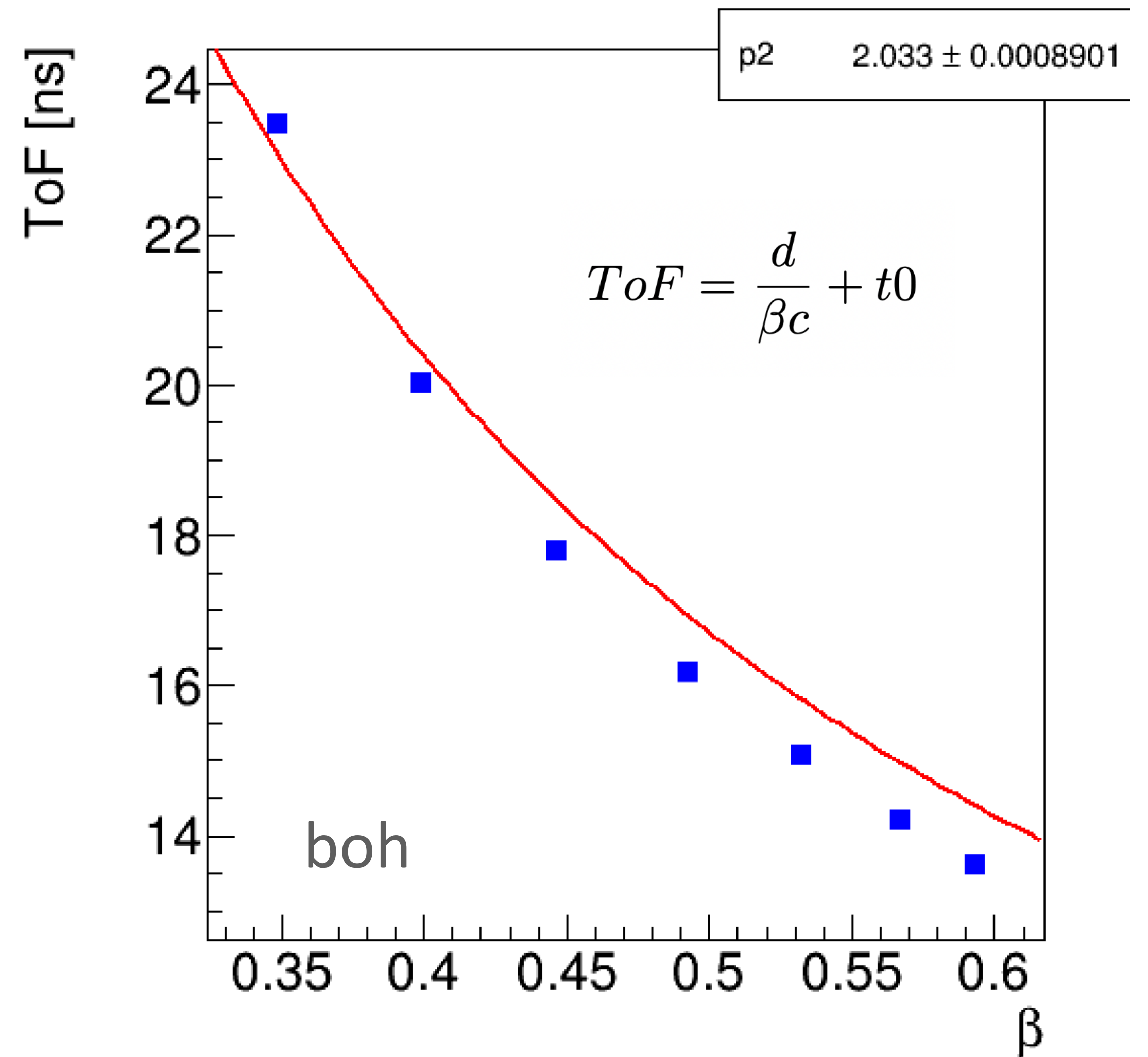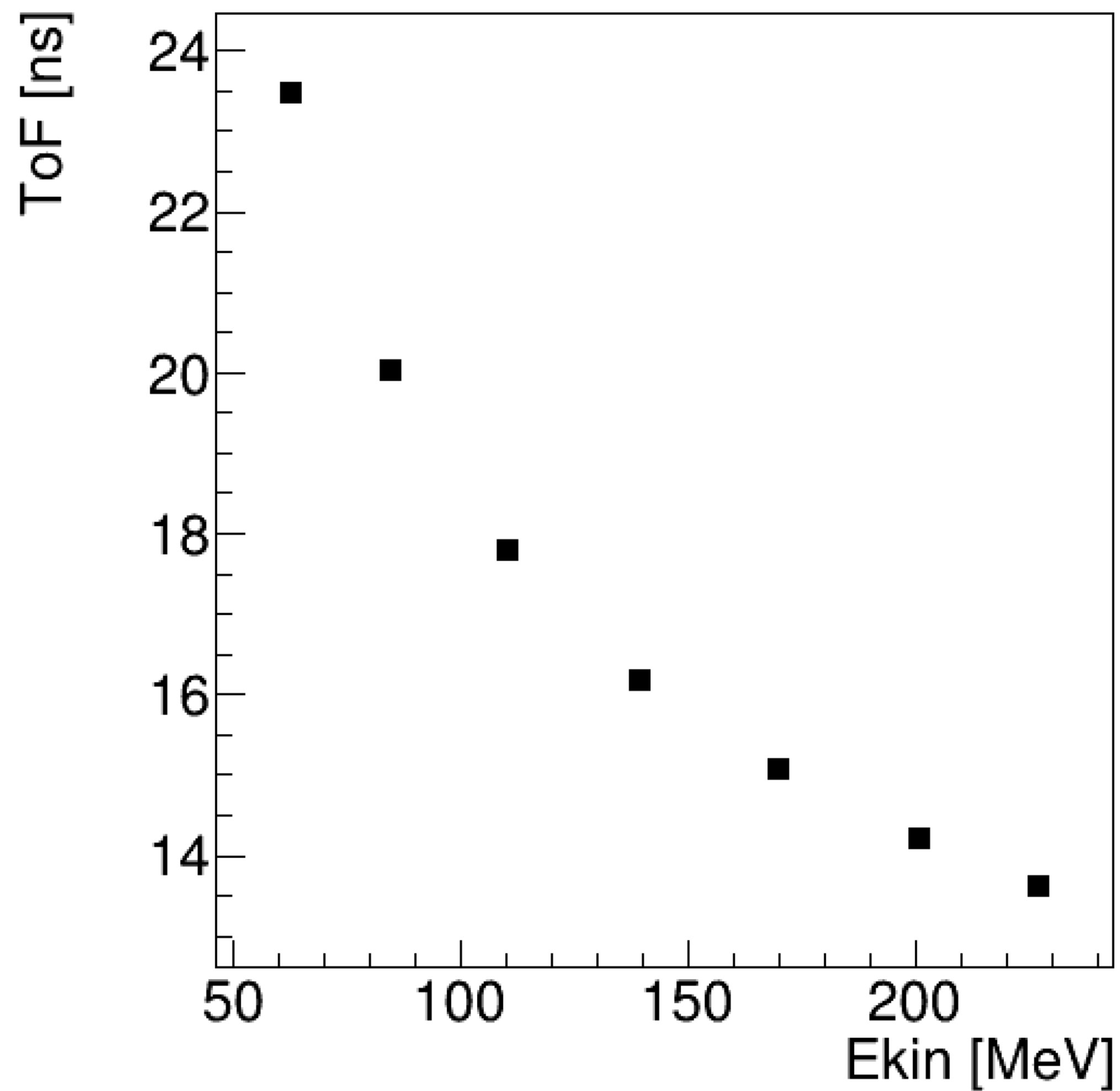
Edge function vs gap depth

- Not clear behaviour... still some troubles in position reconstruction?
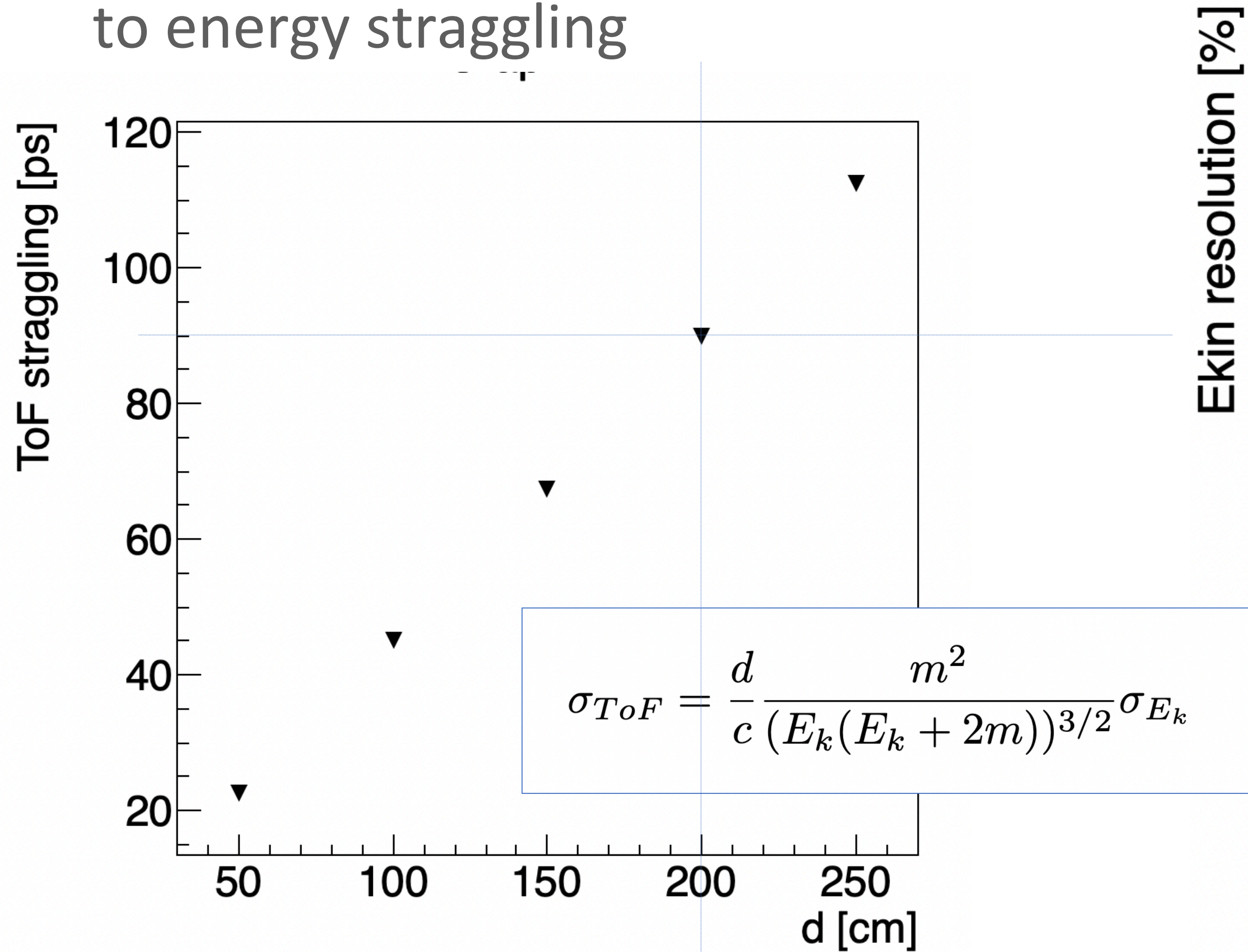
Time resolution

Calib runs, no phantom

ToF calibration

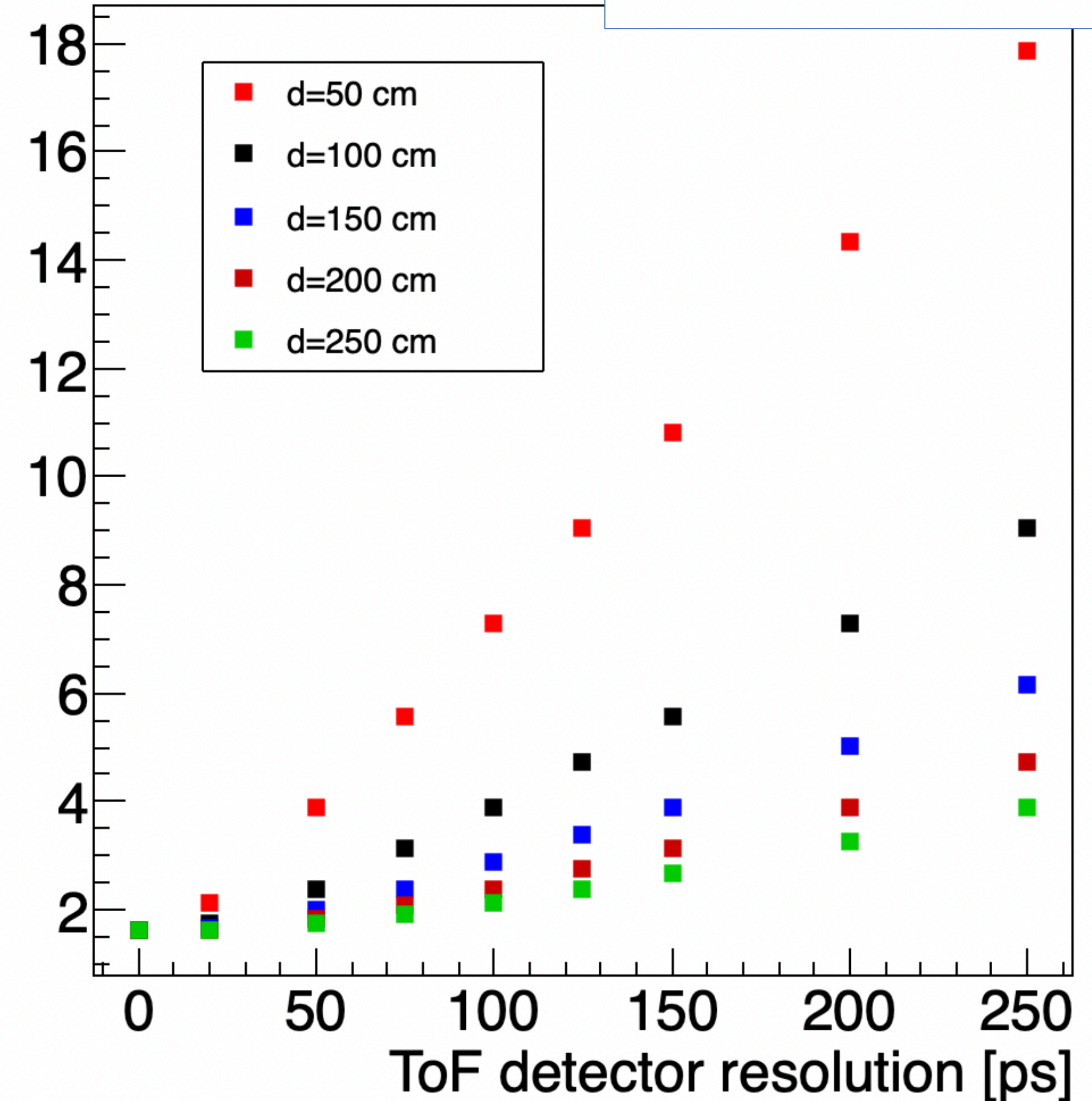$$ToF = \frac{d}{\beta c} + t0$$

p2   2.033 ± 0.0008901

boh

Resolution and distance

ToF intrinsic contribution due to energy straggling

$$\sigma_{E_k} = m \frac{\frac{d^2}{c^2 t^2}}{(1 - \frac{d^2}{c^2 t^2})^{3/2}} \frac{\sigma_t}{t}$$

$$\sigma_{ToF} = \frac{d}{c} \frac{m^2}{(E_k(E_k + 2m))^{3/2}} \sigma_{E_k}$$

2D