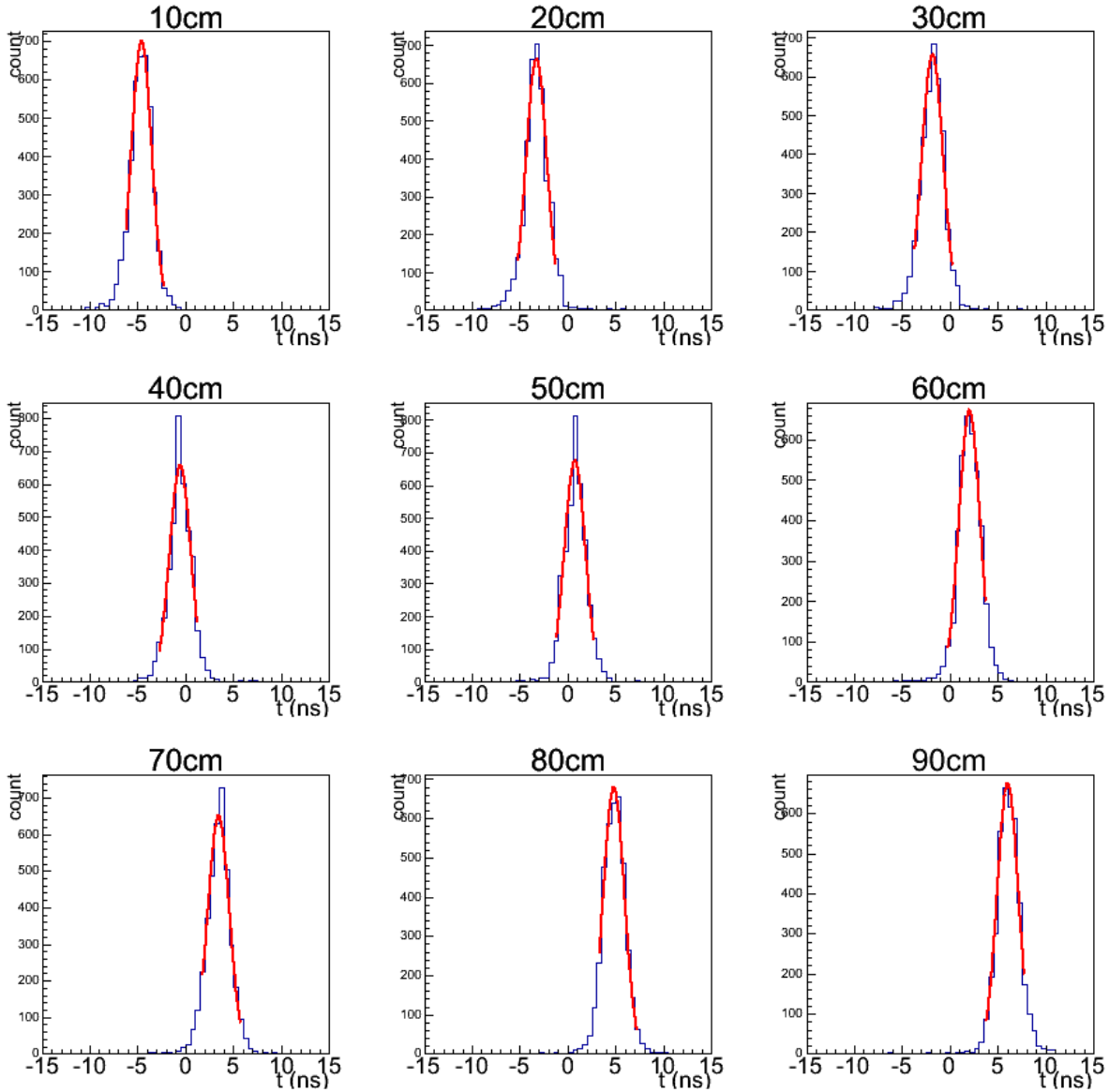
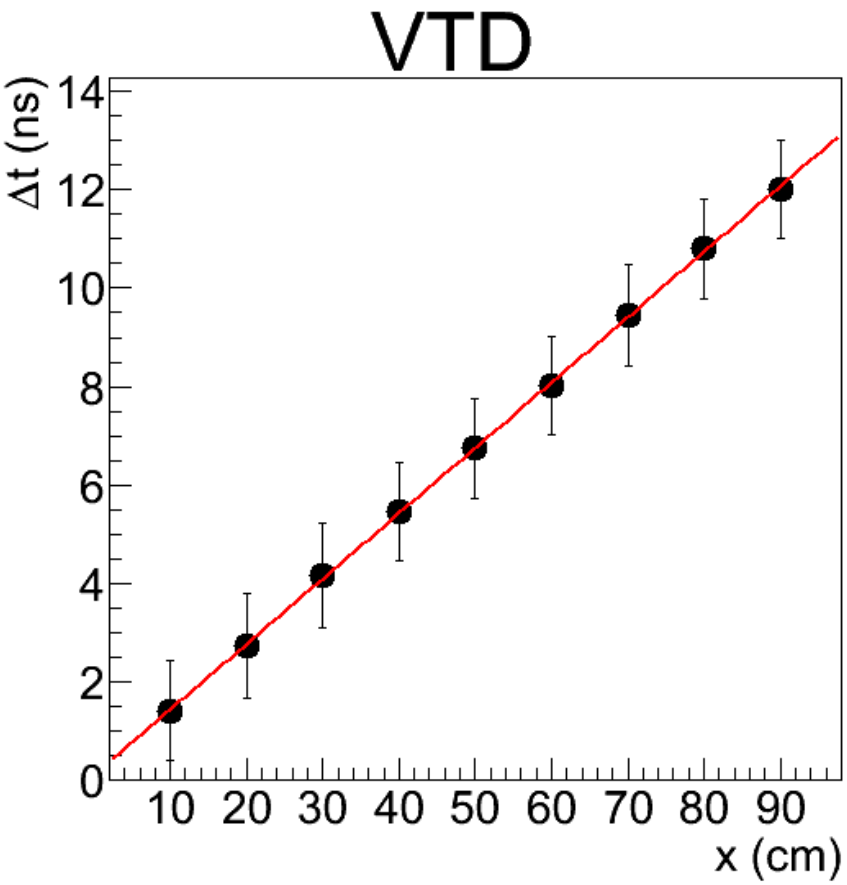
# 2011_12_14_labmeeting

# σ determination

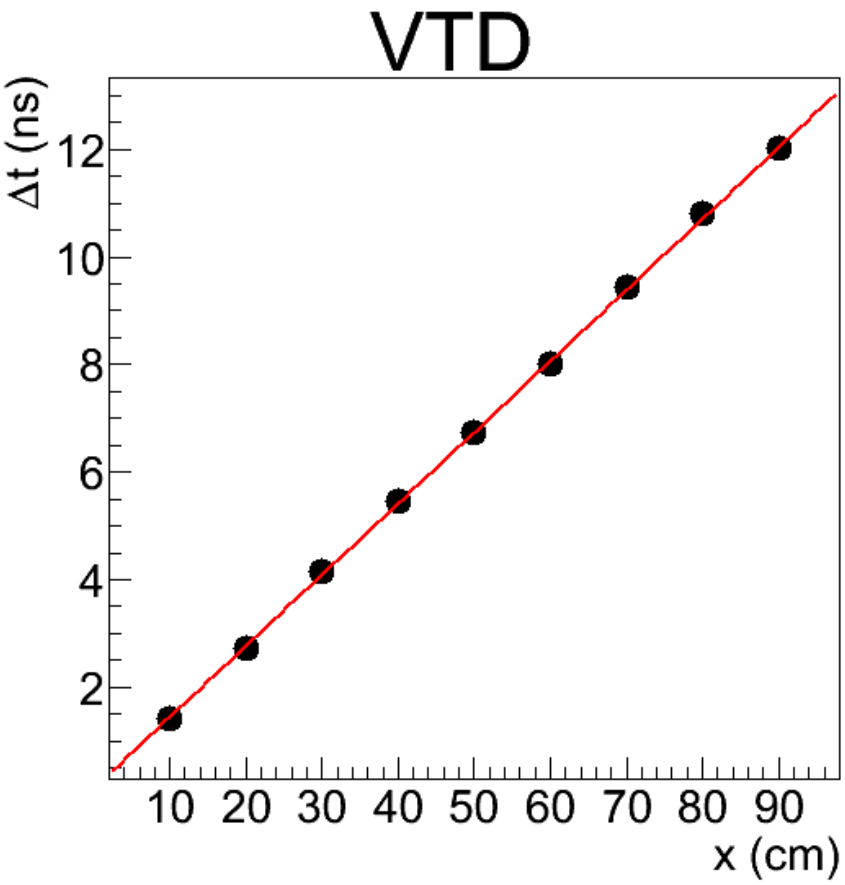
- 1. $\sigma_{\Delta t} = \sigma$
- 2. $\sigma_{\Delta t} = \frac{\sigma}{\sqrt{2}}$



- $\sigma_{\Delta t} = \sigma$




- $\sigma_{\Delta t} = \frac{\sigma}{\sqrt{n}}$



# Error propagation

- $\Delta t = ax + b$
- $x = \acute{a}\Delta t + \acute{b}$
- $\acute{a} = \frac{1}{a}, \acute{b} = -\frac{b}{a}$
- $\sigma_{\acute{a}} = \sqrt{\left(\sigma_a \frac{\partial \acute{a}}{\partial a}\right)^2}, \sigma_{\acute{b}} = \sqrt{\left(\sigma_a \frac{\partial \acute{b}}{\partial a}\right)^2 + \left(\sigma_b \frac{\partial \acute{b}}{\partial b}\right)^2}$
- $\sigma_x = \sqrt{\left(\sigma_{\Delta t} \frac{\partial x}{\partial \Delta t}\right)^2 + \left(\sigma_{\acute{a}} \frac{\partial x}{\partial \acute{a}}\right)^2 + \left(\sigma_{\acute{b}} \frac{\partial x}{\partial \acute{b}}\right)^2}$

- $\sigma_{\Delta t} = \sigma$
- $x = a\Delta t + b$
- $a = 7.51 \pm 0.74$
- $b = -0.71 \pm 5.59$
- $\sigma_x = 10.95$ cm

- $\sigma_{\Delta t} = \frac{\sigma}{\sqrt{n}}$
- $x = a\Delta t + b$
- $a = 7.56 \pm 0.03$
- $b = -0.93 \pm 0.15$
- $\sigma_x = 0.71$ cm