

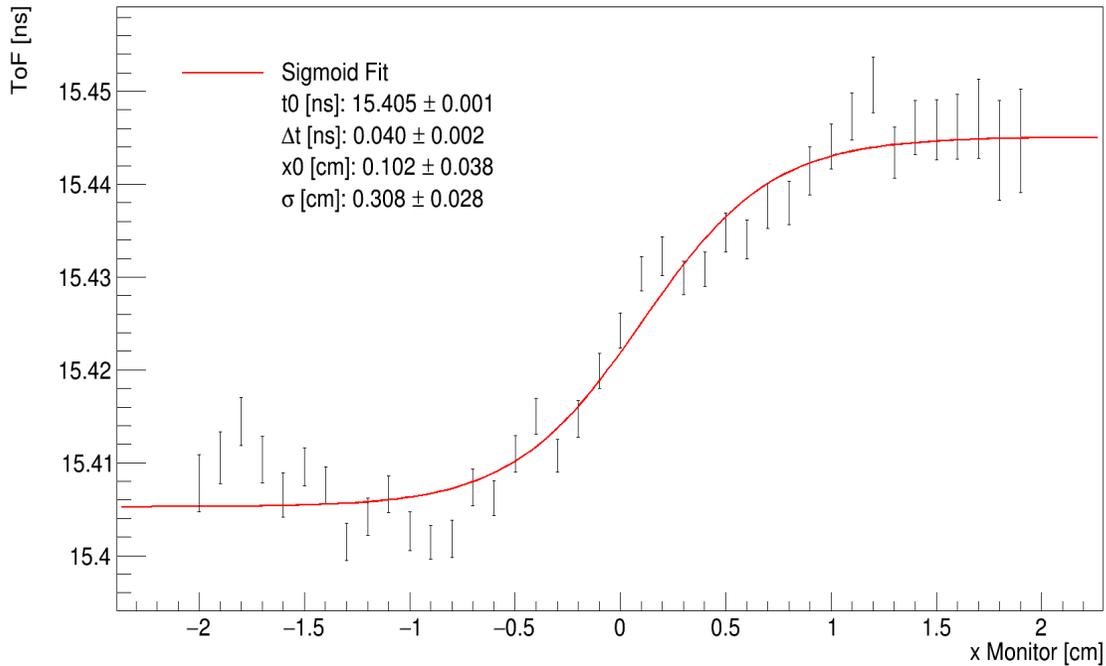
Tofprad meeting
Data analysis update
11 aprile 2024

Ricostruzione profili e calibrazione temporale

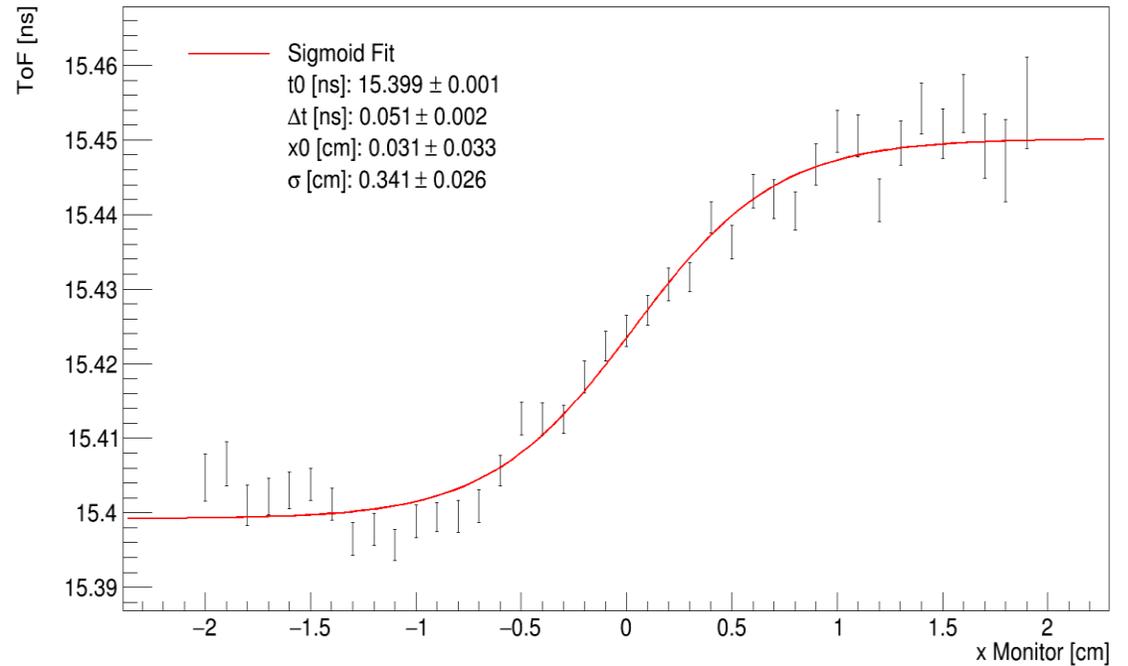
- Al variare dell'airgap sono stati ricostruiti i profili di ToF in funzione della posizione sul BM;
- Utilizzando i dati della run5, acquisita con fantoccio da 14 cm, sono stati calcolati i ToF relativi alle barre del TW con statistica sufficiente;
- I valori di ToF ottenuti dall'analisi della run5 sono stati sottratti in fase di ricostruzione dei profili ToF vs xMonitor.

Ricostruzione profili ToF vs posizione sul BM

Time of Flight vs xHit Position_slab: 2 mm



Time of Flight vs xHit Position_slab: 3 mm

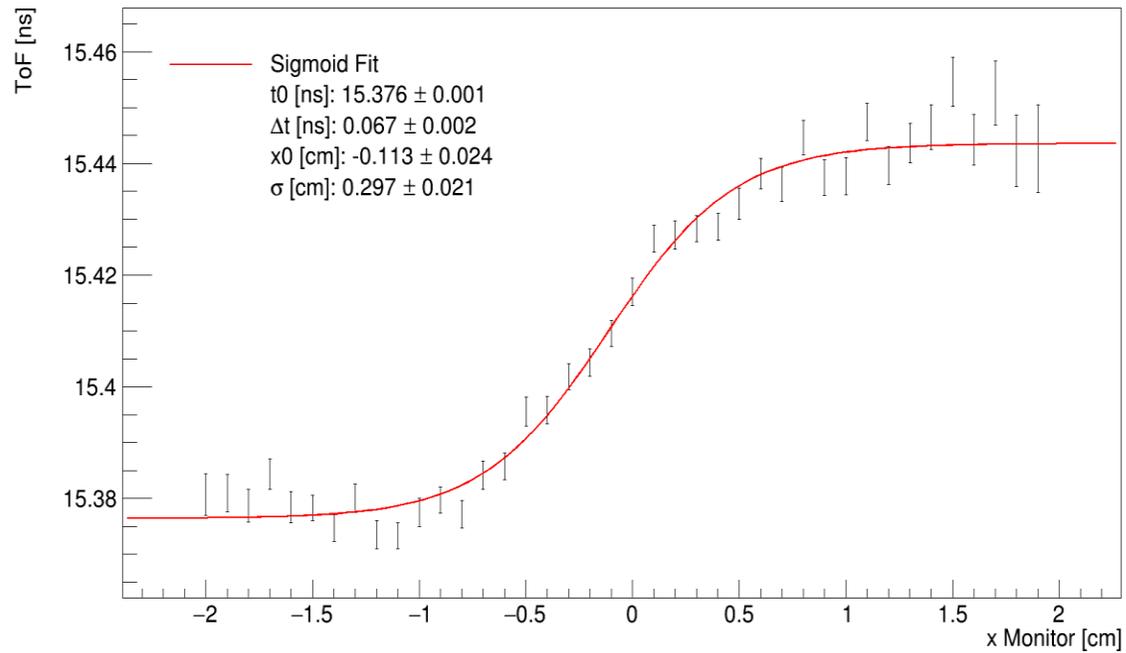


NOTA: i valori di ToF sono stati ottenuti considerando tutti gli eventi in cui si sono accese solamente 2 barre del TW, una nel layer 0 e una nel layer 1.

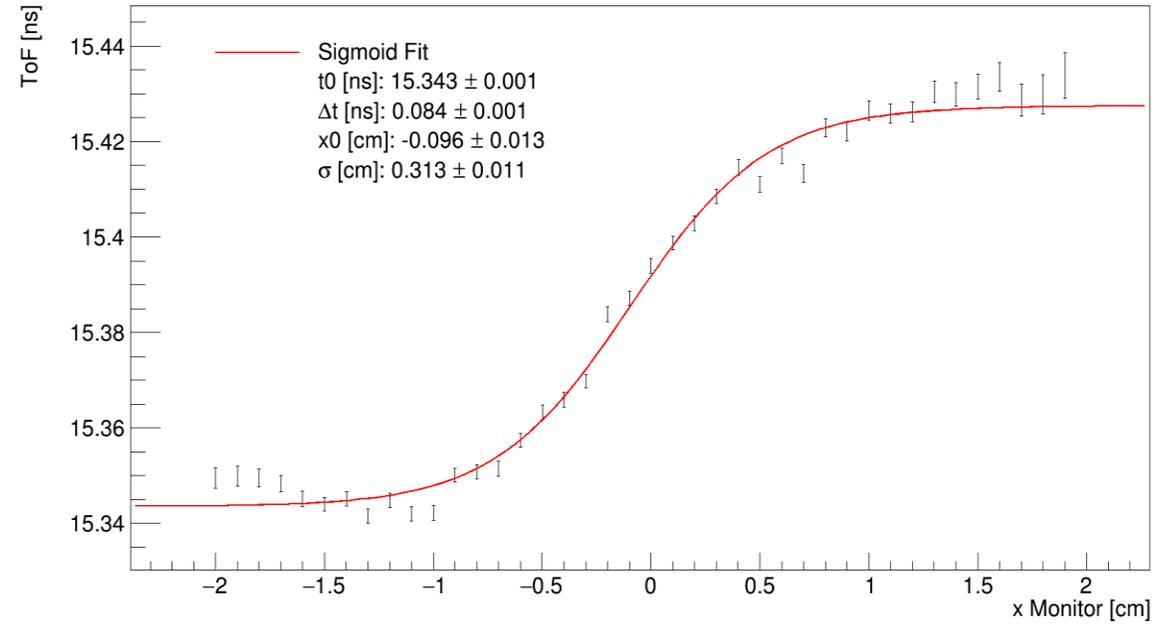
$$ToF = \left(\frac{TimeBar_{layer0} + TimeBar_{layer1}}{2} \right) - TimeStartCounter$$

Ricostruzione profili ToF vs posizione sul BM

Time of Flight vs xHit Position_slab: 4 mm

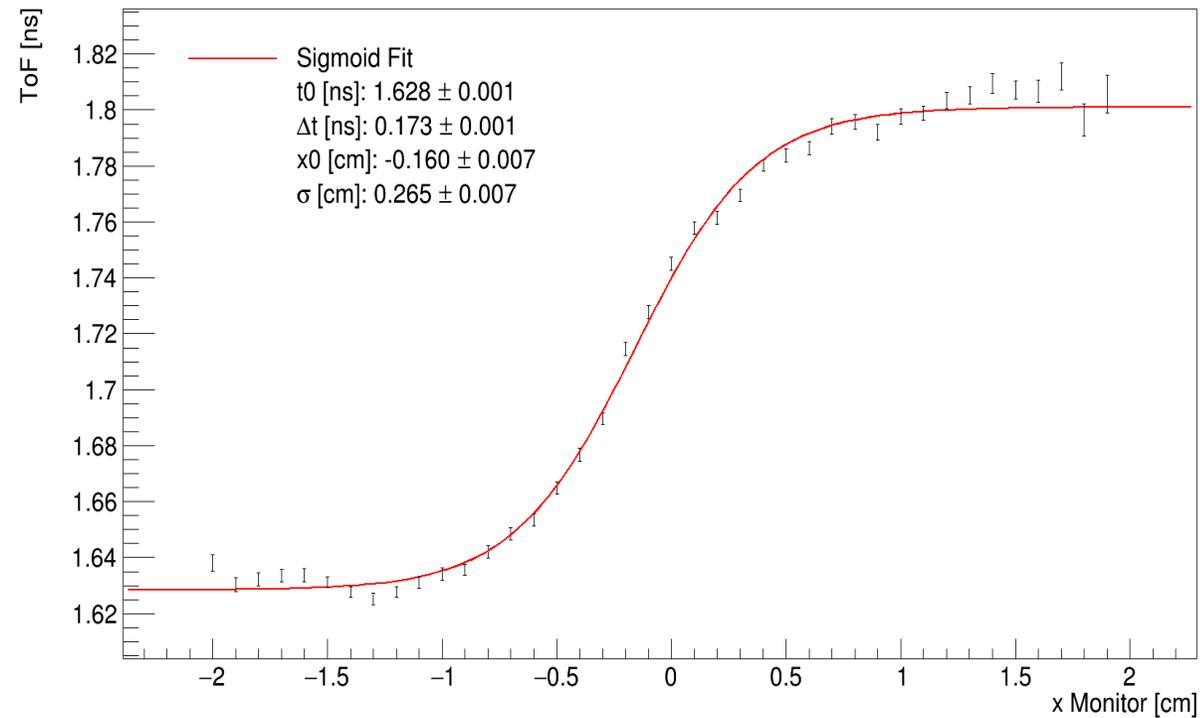


Time of Flight vs xHit Position_slab: 5 mm

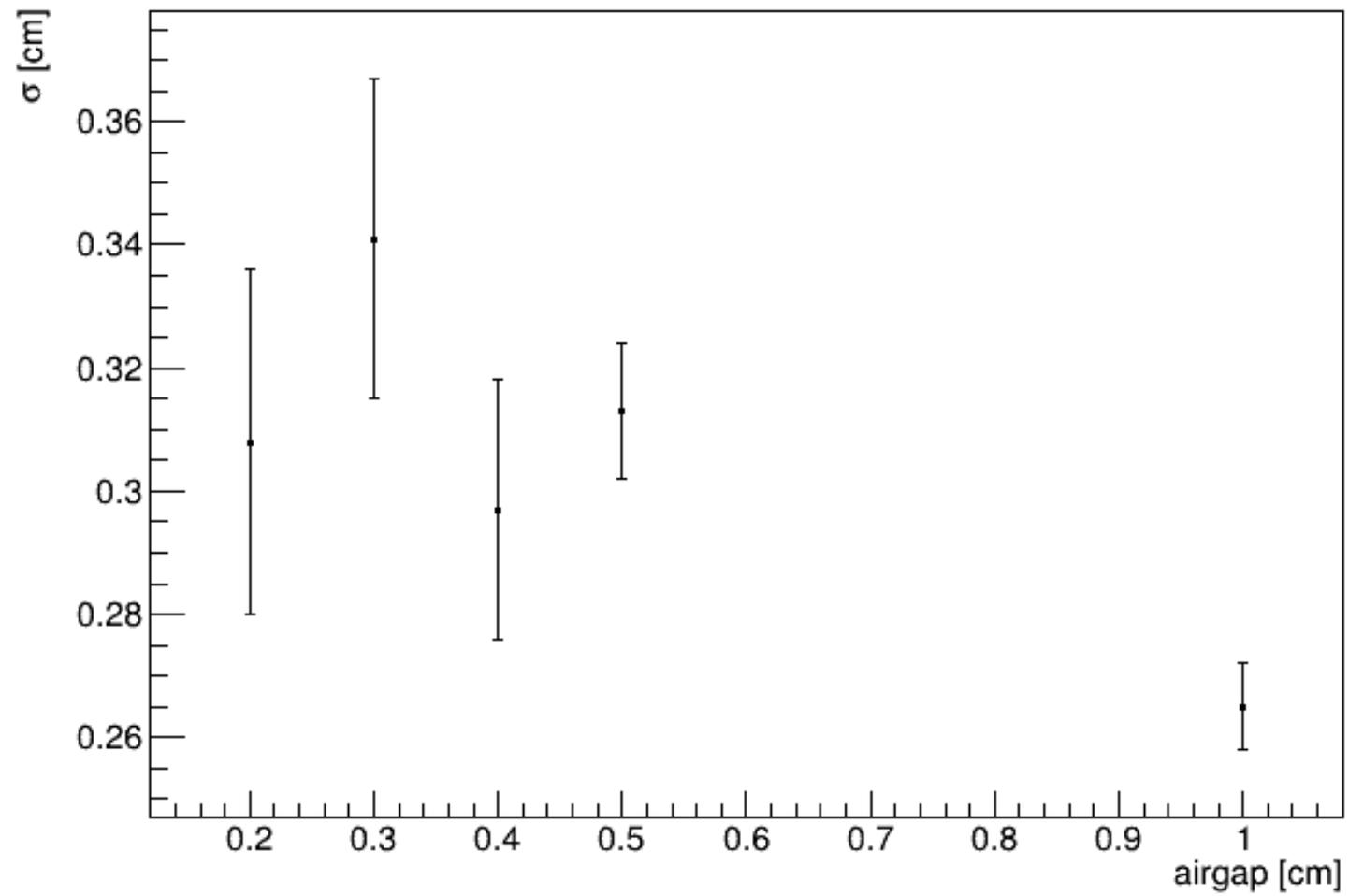


Ricostruzione profili ToF vs posizione sul BM

Time of Flight vs xHit Position_slab: 1 cm



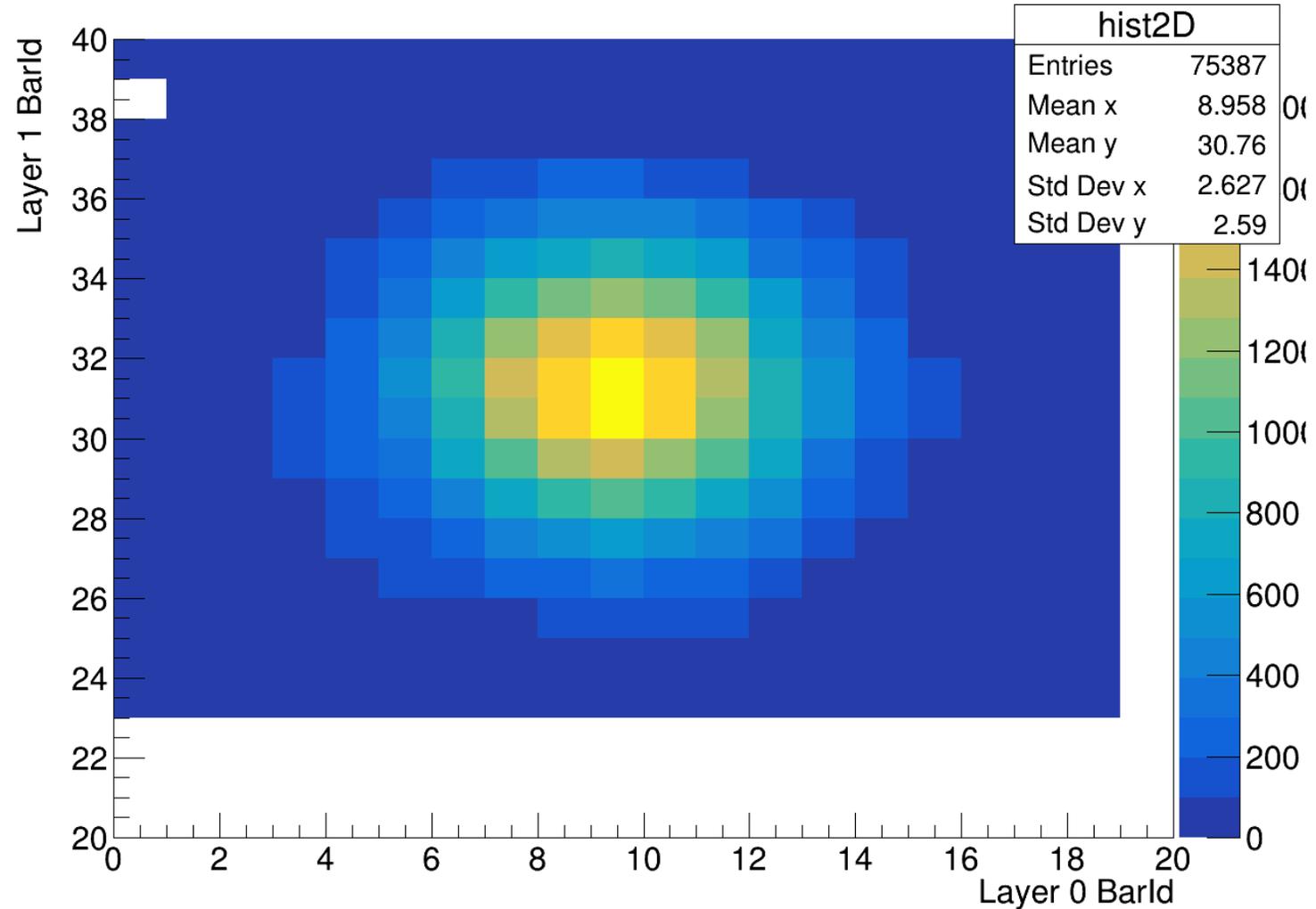
σ vs airgap



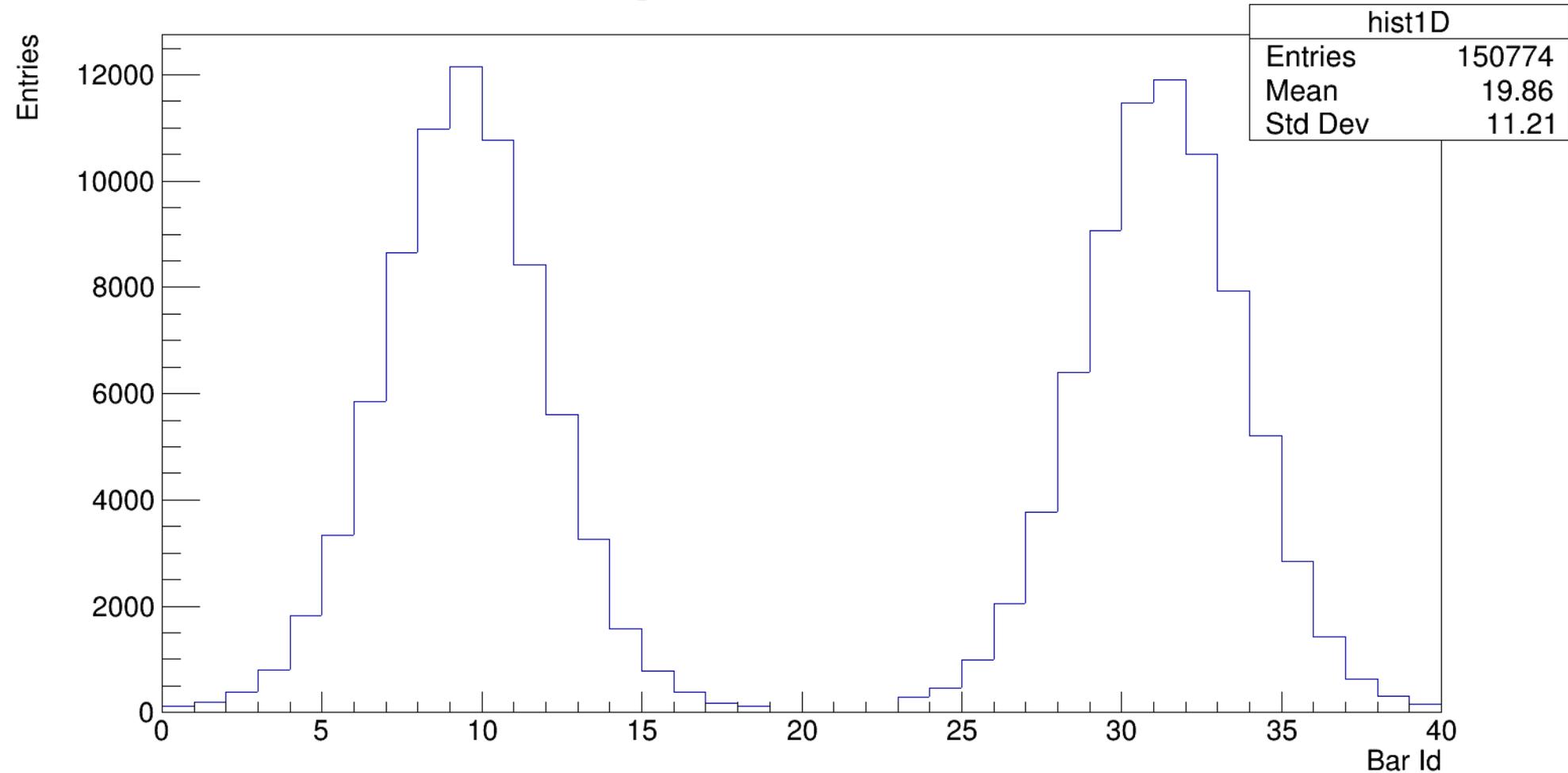
Calibrazione temporale

Mappa TW run5-fantoccio 14 cm

TW hit 2D Histogram - run5_fantoccio14cm.root



Position Histogram - run5_fantoccio14cm.root

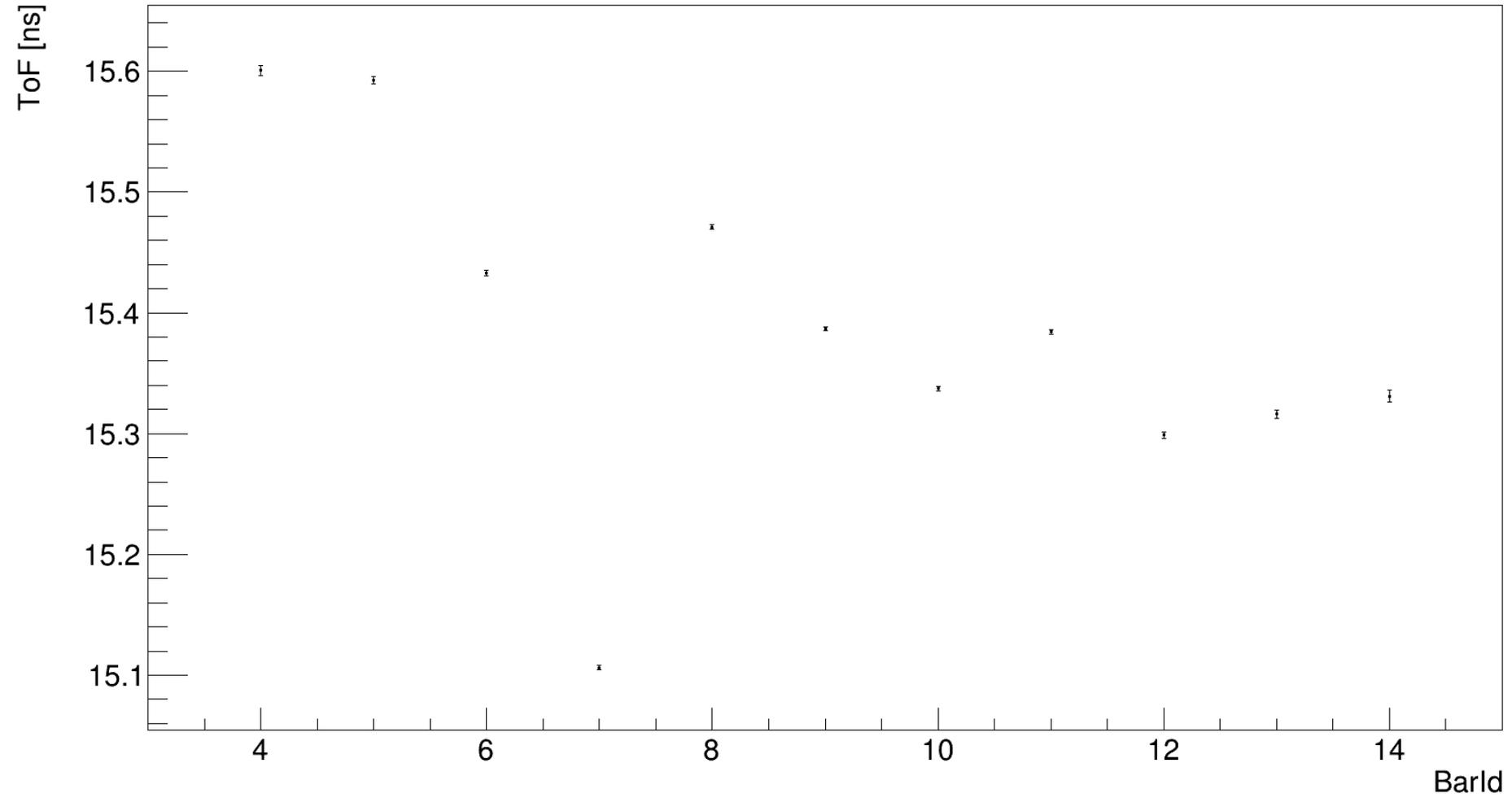


Le barre selezionate per la calibrazione temporale sono:

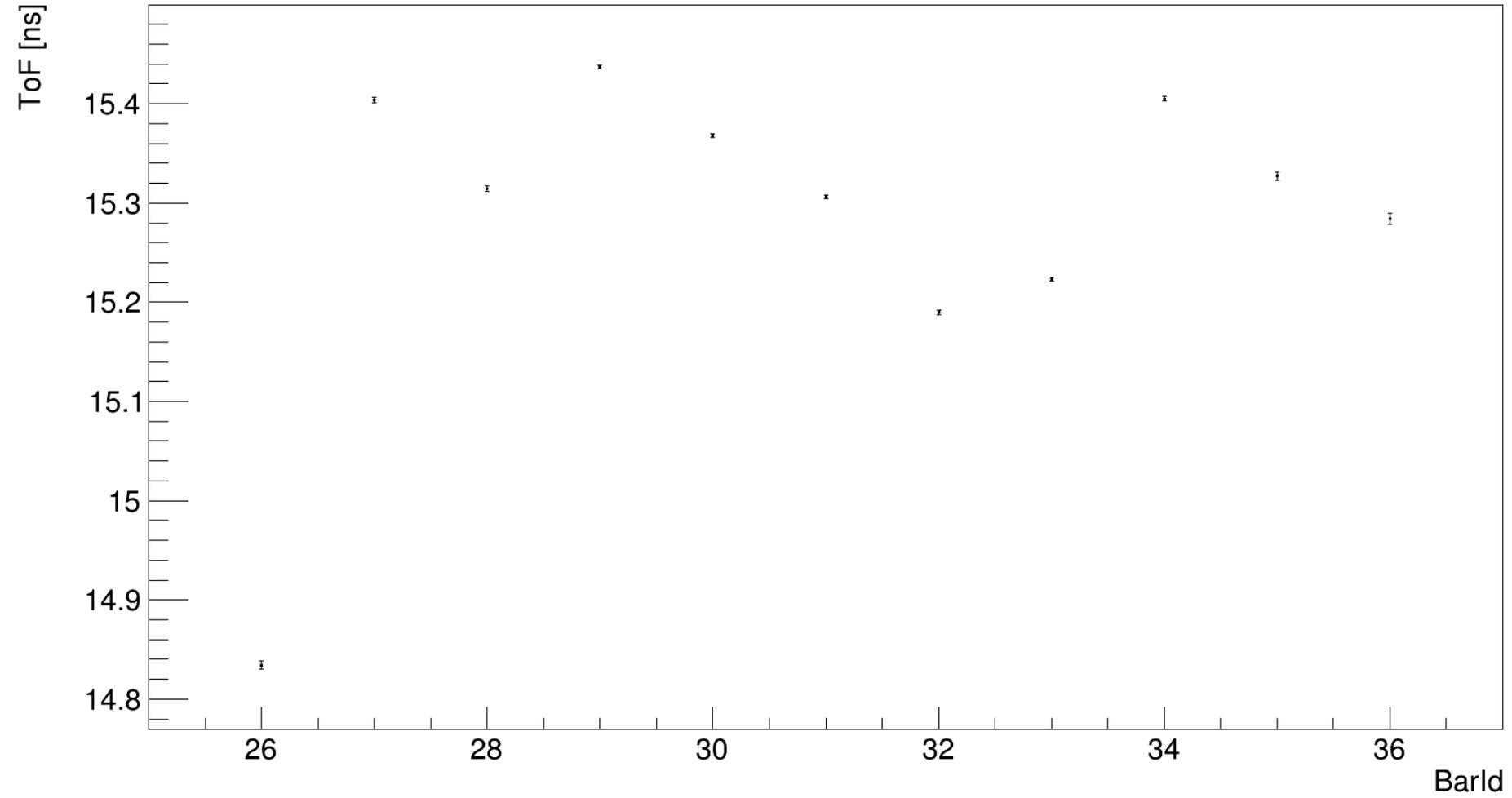
- dalla 4 alla 14 nel layer 0;
- dalla 26 alla 36 nel layer 1.

Il ToF ottenuto per le singole barre è: $ToF = TimeBar - Time_{StartCounter}$

ToF vs BarId (layer 0)



ToF vs BarId (layer 1)



Profili a confronto

Slab d'aria di 2 mm

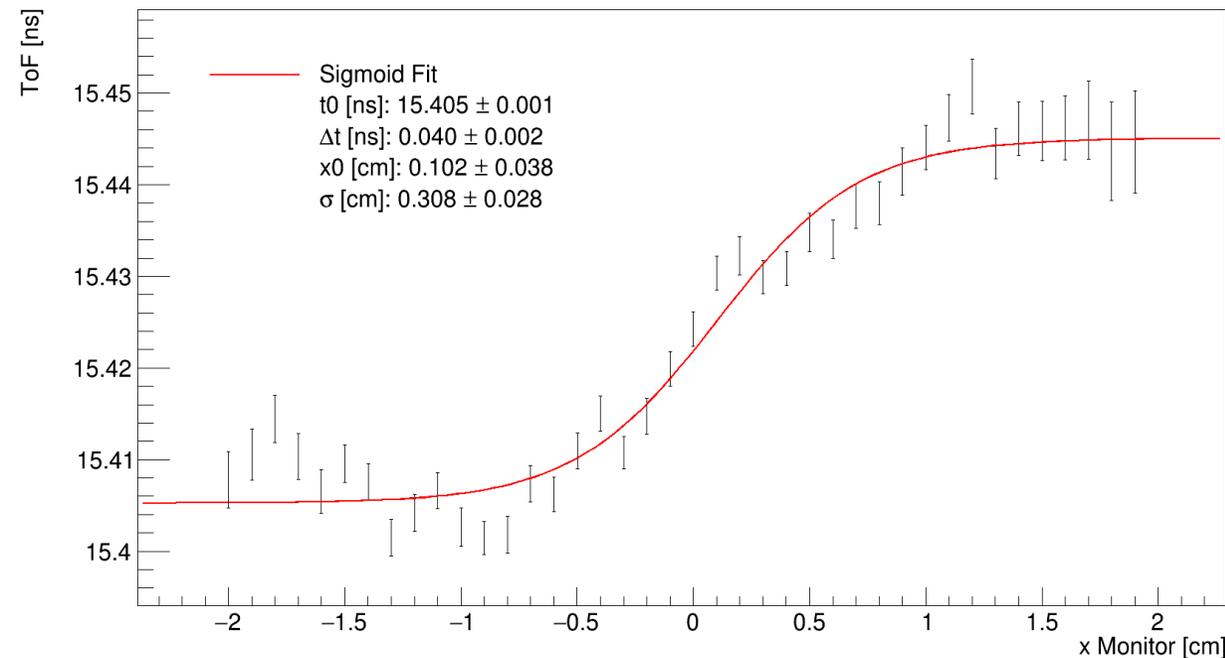
NOTA: da questa slide in poi i profili mostrati sulla destra sono i profili calibrati.

Il ToF, infatti, è stato ottenuto in questo modo:

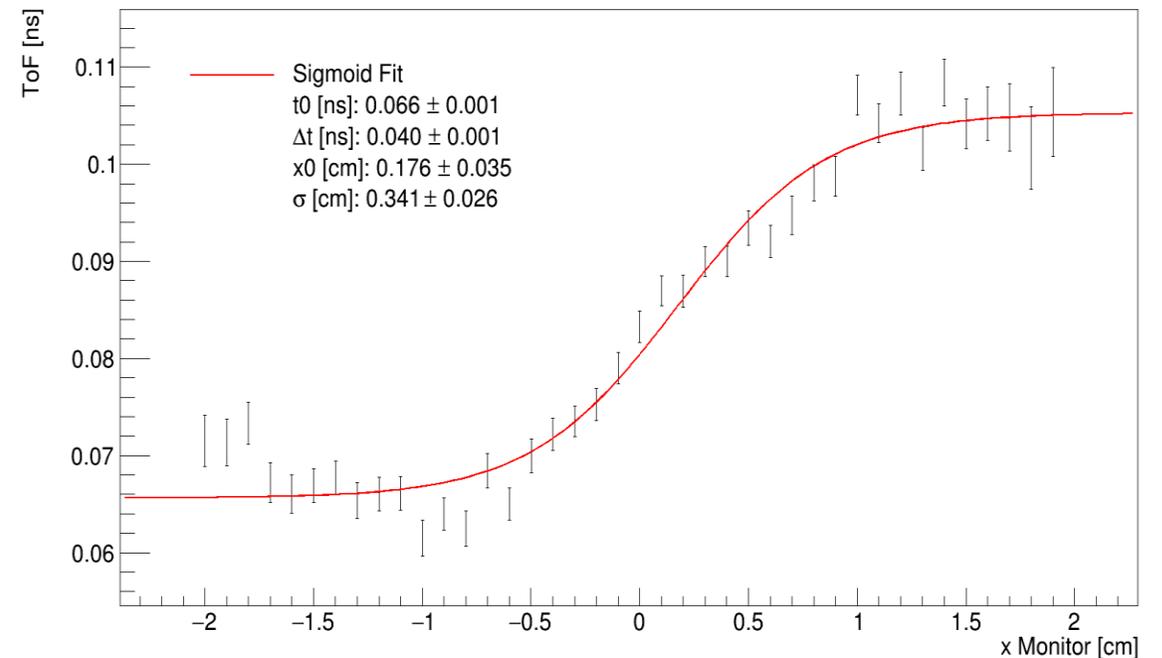
$$ToF = \left[\frac{(TimeBar_{layer0,n_1} - ToF_{14cmH_2O,n_1}) + (TimeBar_{layer1,n_2} - ToF_{14cmH_2O,n_2})}{2} \right] - Time_{StartCounter}$$

Dove ToF_{14cmH_2O,n_1} è il tempo di volo della barra n_1 ottenuto dall'analisi della run5 con fantoccio da 14 cm.

Time of Flight vs xHit Position_slab: 2 mm



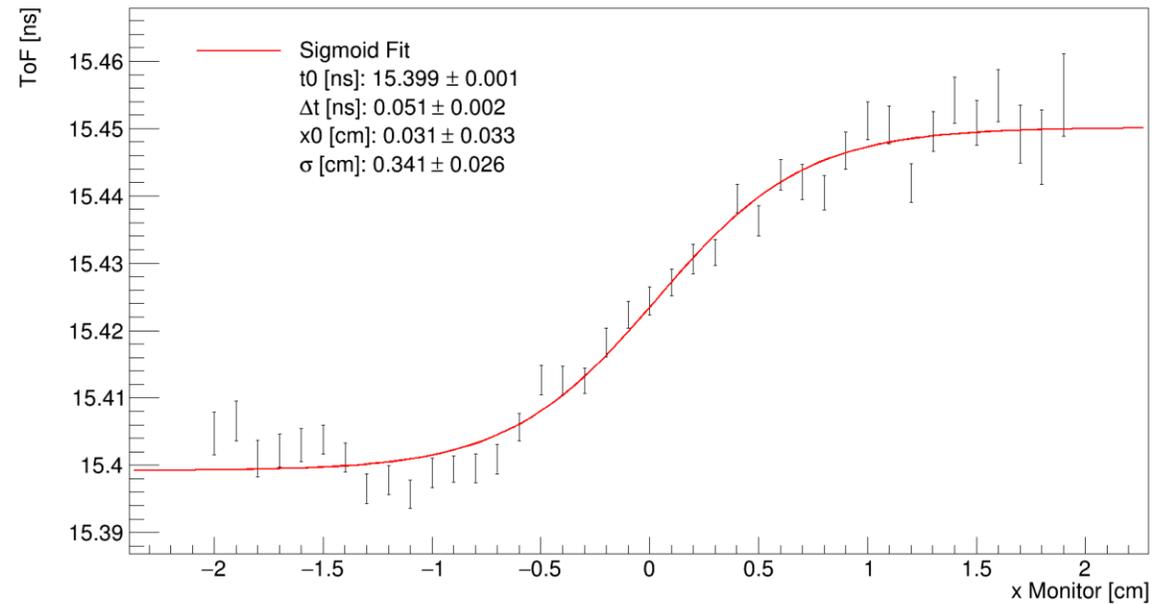
Time of Flight vs xHit Position_slab: 2 mm [calibrated]



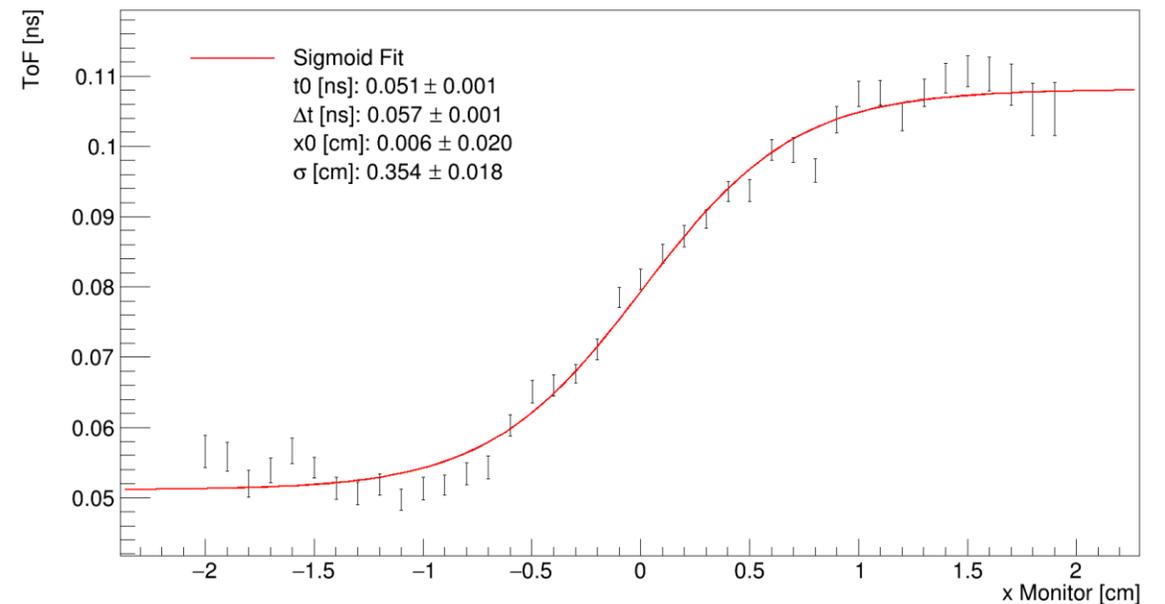
Profili a confronto

Slab d'aria di 3 mm

Time of Flight vs xHit Position_slab: 3 mm



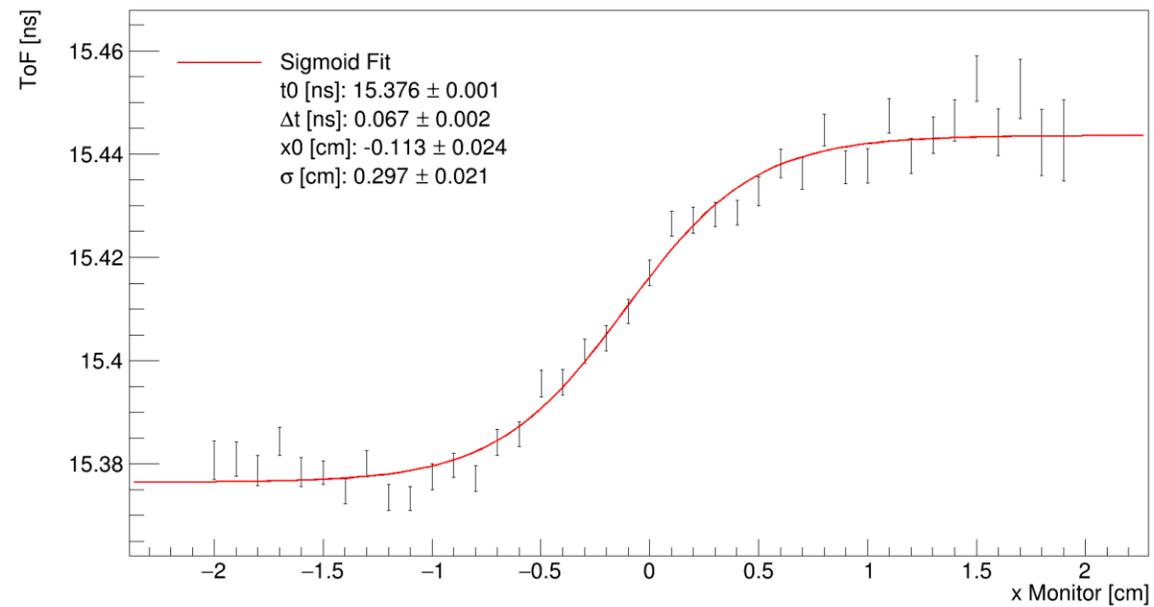
Time of Flight vs xHit Position_slab: 3 mm [calibrated]



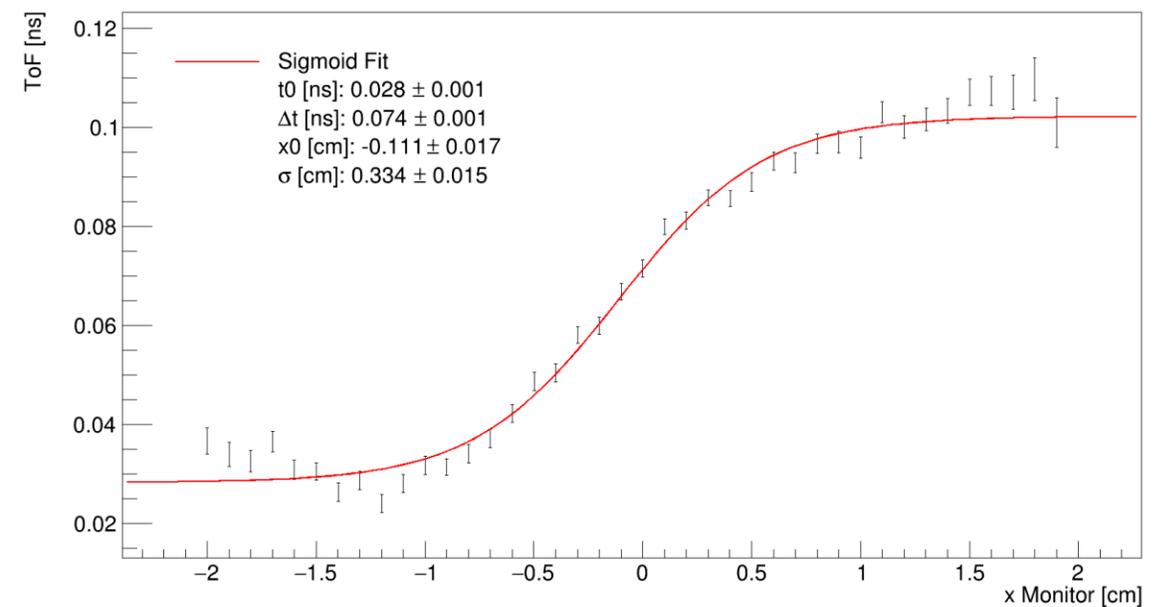
Profili a confronto

Slab d'aria di 4 mm

Time of Flight vs xHit Position_slab: 4 mm



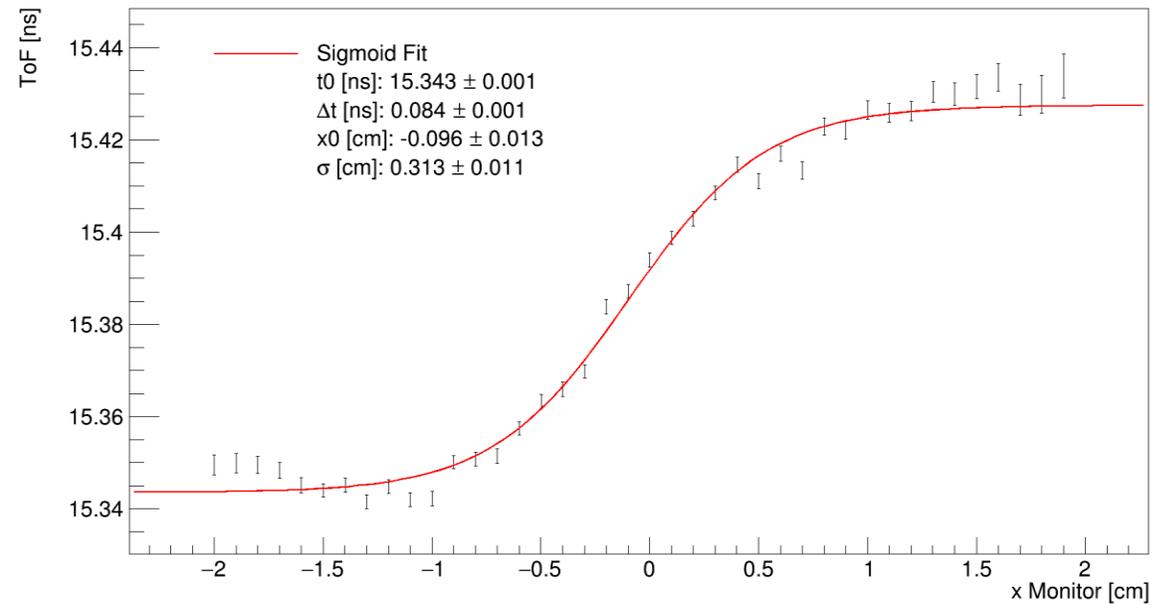
Time of Flight vs xHit Position_slab: 4 mm [calibrated]



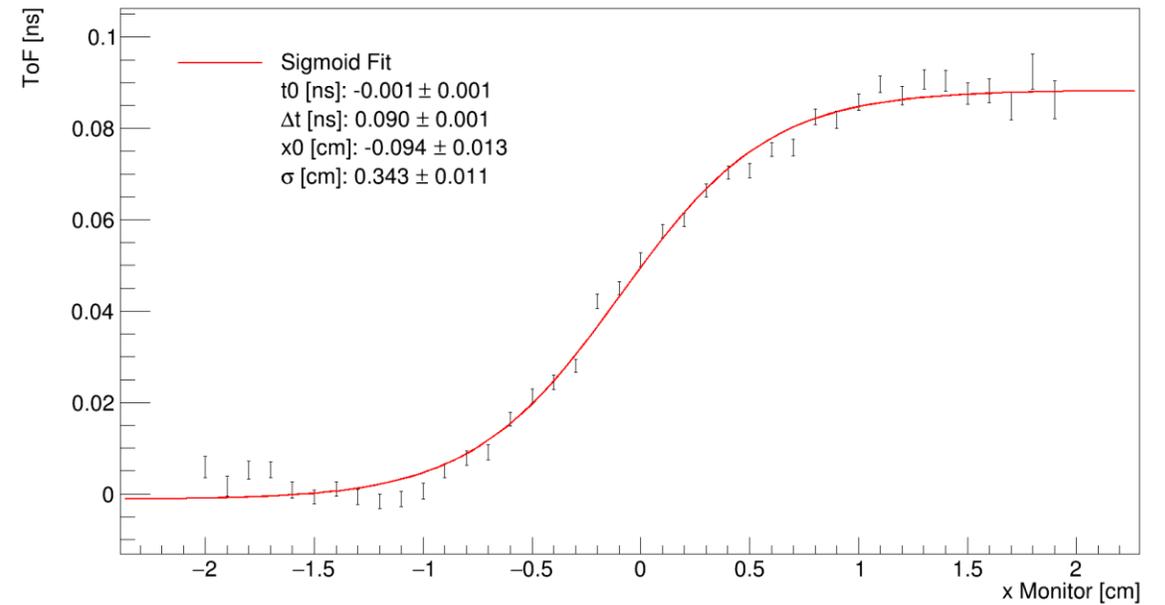
Profili a confronto

Slab d'aria di 5 mm

Time of Flight vs xHit Position_slab: 5 mm



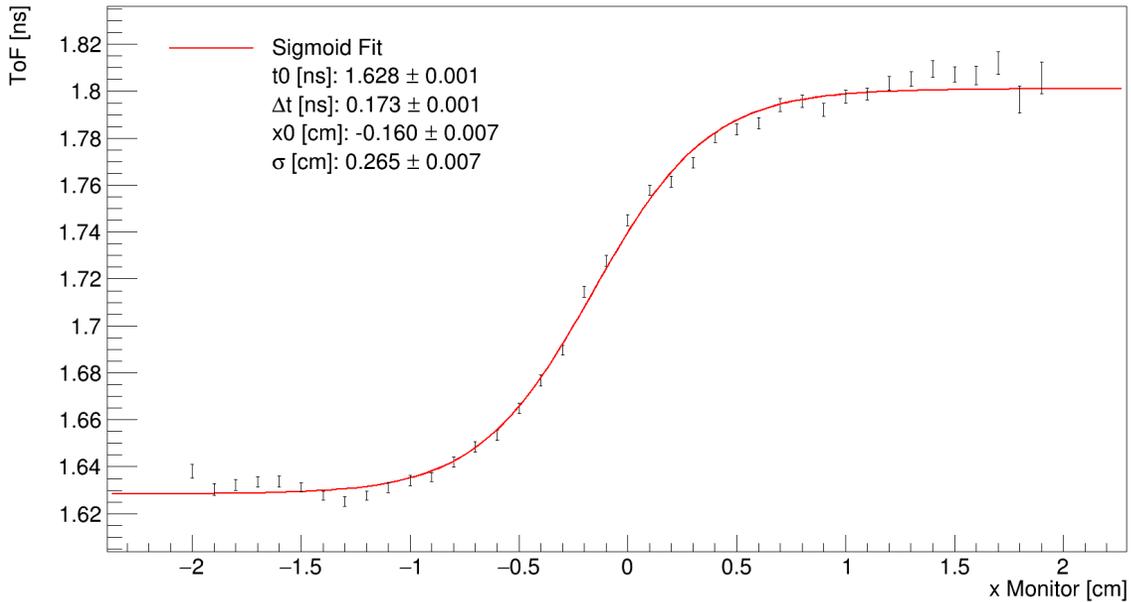
Time of Flight vs xHit Position_slab: 5 mm [calibrated]



Profili a confronto

Slab d'aria di 1 cm

Time of Flight vs xHit Position_slab: 1 cm



Time of Flight vs xHit Position_slab: 1 cm [calibrated]

