

20171124 STATUS REPORT

Ahram lee

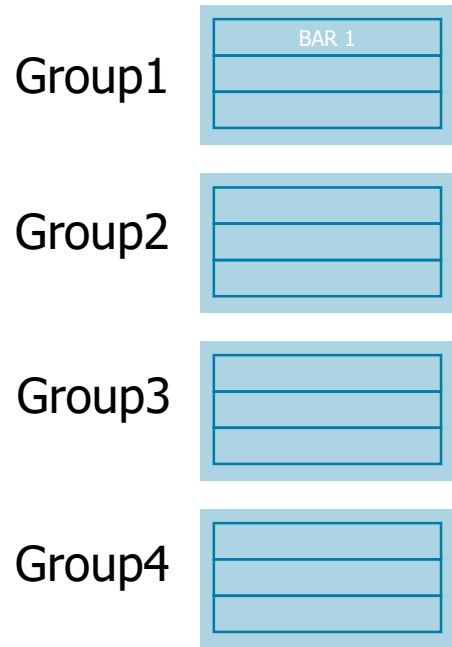
CERN Data Information

/dataRC_old/	#181	07-21 (3h)	11,528 entries	4bar trigger, th=200
	#202		19,632 entries	
/dataRC/	#48	08-17 ~ 08-18 (2d)	218,112 entries	6bar trigger, th=100
	#76	08-21 ~ 08-22 (2d)	177,860 entries	
	#120	08-25 ~ 08-29 (4d)	928,000 entries	
	#151	08-30 ~ 09-06 (7d)	1,502,436 entries	
	#170	bhokim(~10/2)	434,340 entries	
	#172	bhokim(10/2~)	204,244 entries	
	#174		518,896 entries	

Time resolution

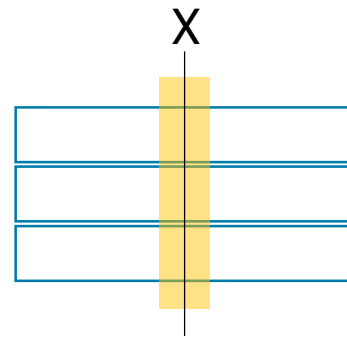
On various positions – analysis method

1. Grouping



2. Region selecting

select the events within $\pm 5\text{cm}$ from the position(X).



$$X \in \{-80, -70, \dots, 0, \dots, 70, 80\}$$

3. dT distribution fitting & Reducing

$$dTmean_{\alpha} = Tmean_1 - Tmean_2$$

$$dTmean_{\beta} = Tmean_2 - Tmean_3$$

$$dTmean_{\gamma} = Tmean_3 - Tmean_1$$

or

$$dTfast_{\alpha} = Tfast_1 - Tfast_2$$

$$dTfast_{\beta} = Tfast_2 - Tfast_3$$

$$dTfast_{\gamma} = Tfast_3 - Tfast_1$$

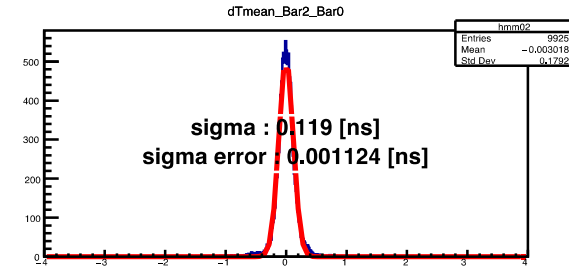
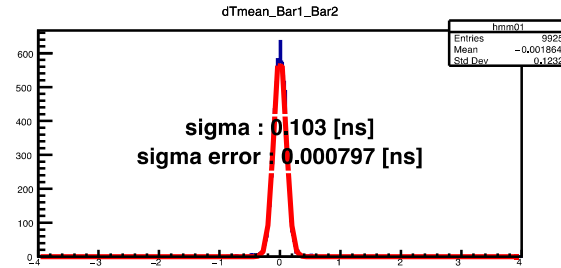
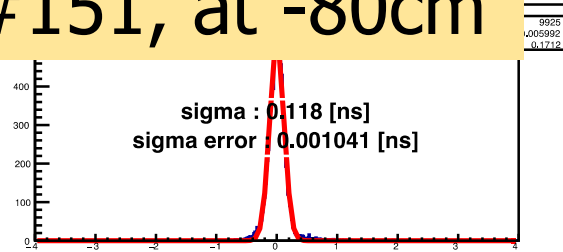
$$\sigma_{\alpha}^2 = \sigma_1^2 + \sigma_2^2$$

$$\longrightarrow \sigma_{\beta}^2 = \sigma_2^2 + \sigma_3^2$$

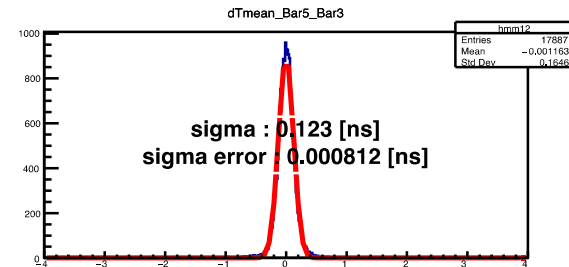
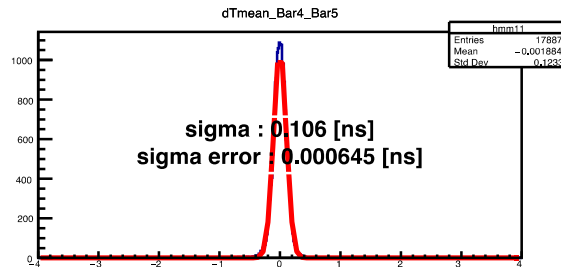
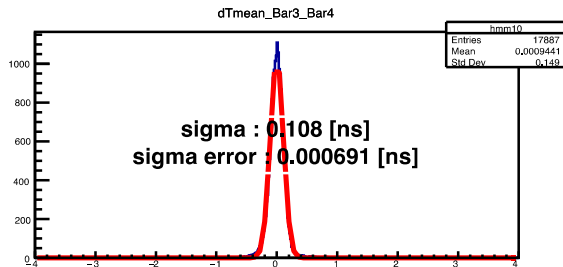
$$\sigma_{\gamma}^2 = \sigma_3^2 + \sigma_1^2$$

dTmean distribution fitting results

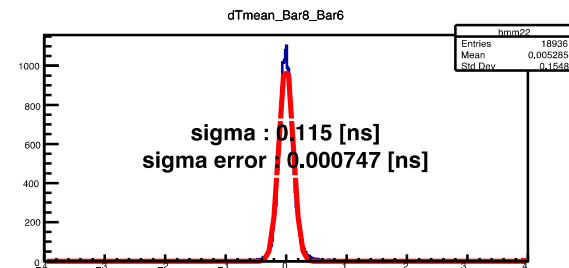
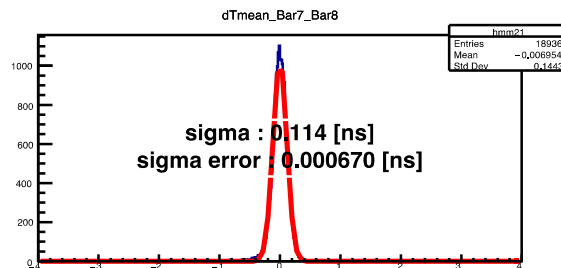
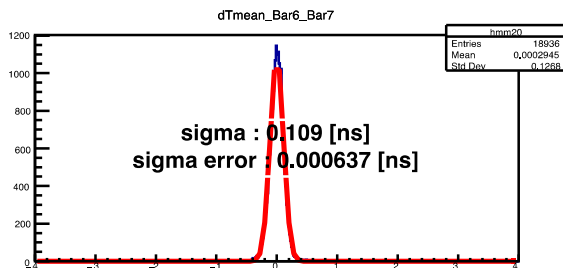
Run #151, at -80cm



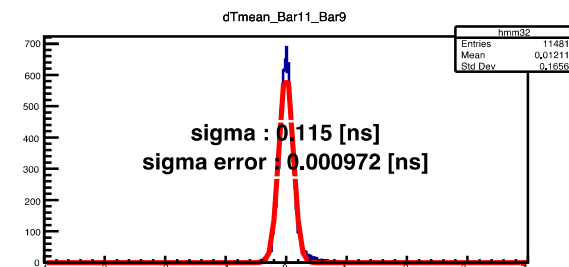
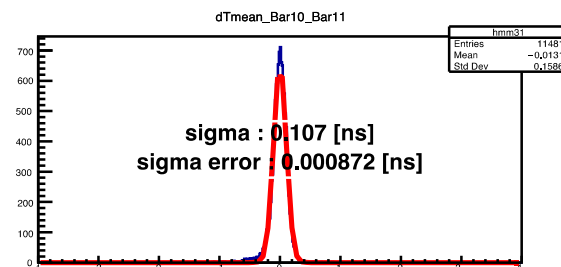
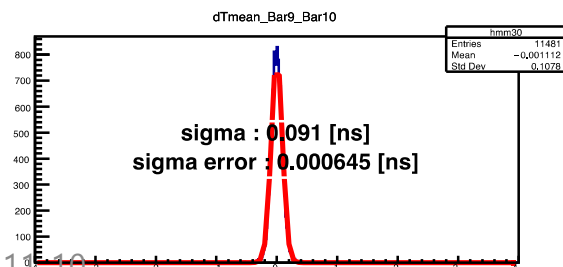
Group1



Group2



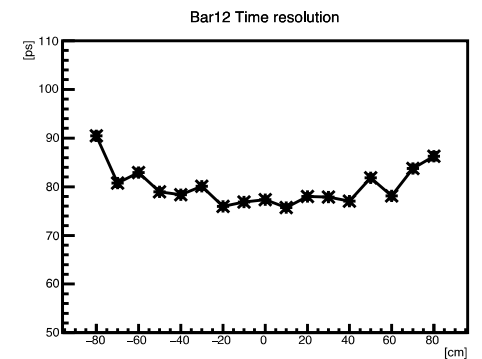
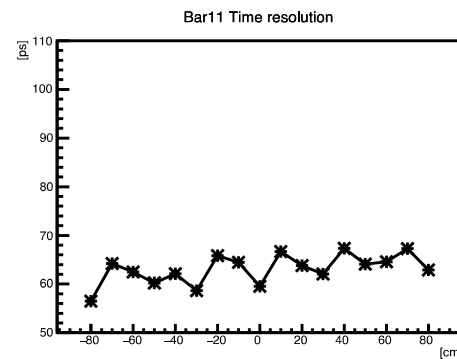
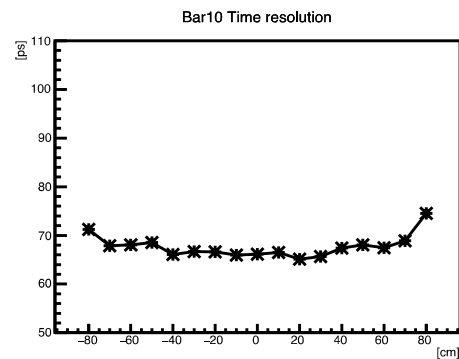
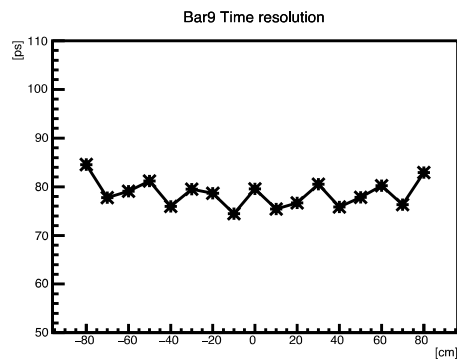
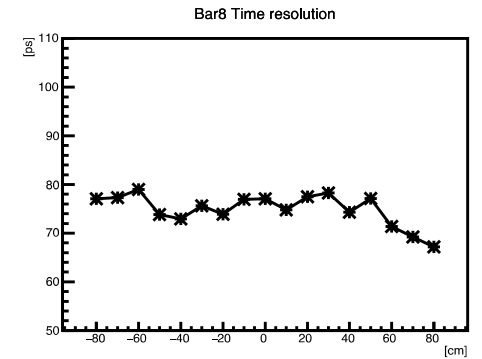
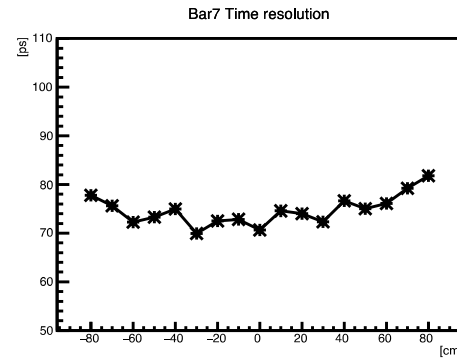
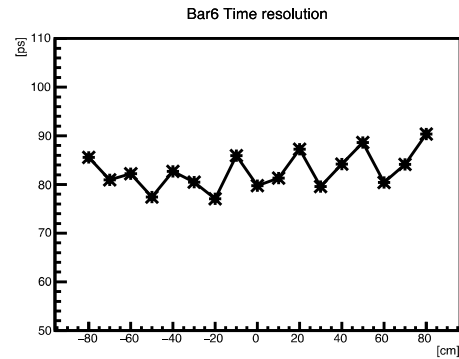
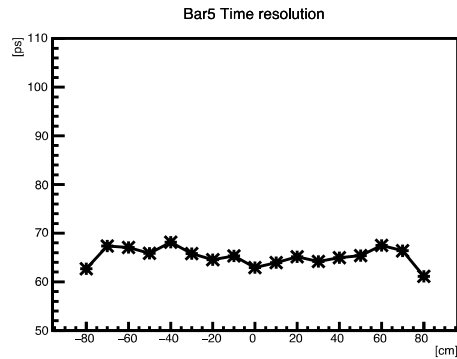
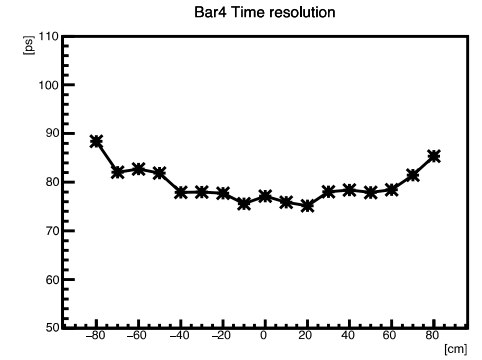
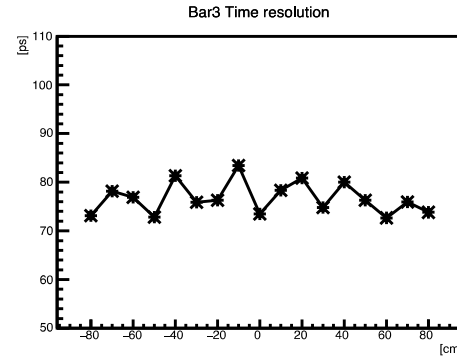
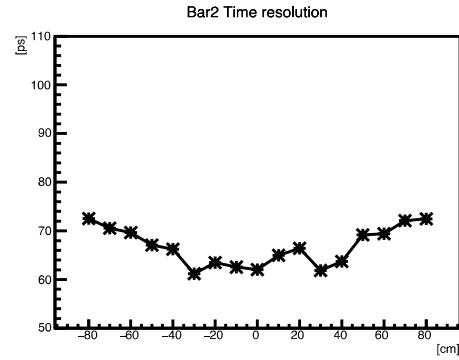
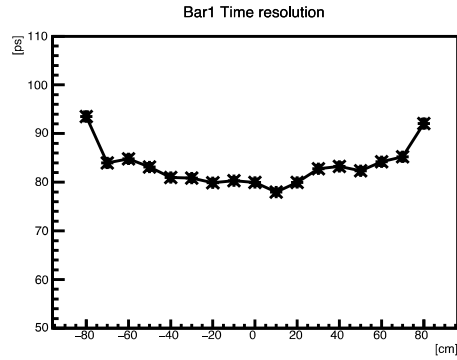
Group3



Group4

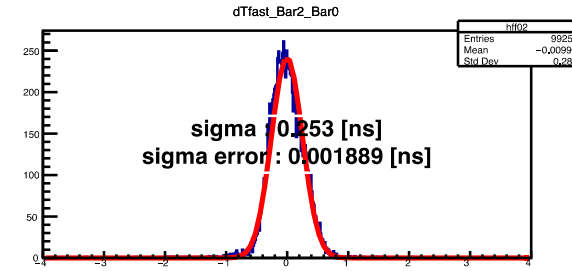
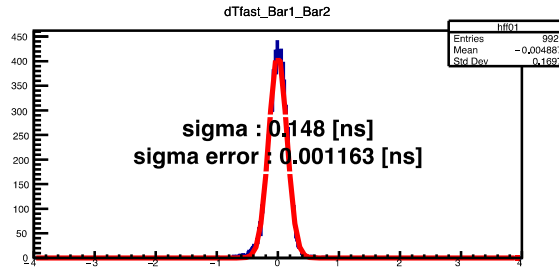
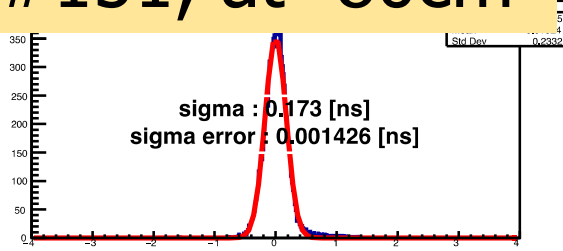
(Time resolution) vs (position)

Run #151, dTmean

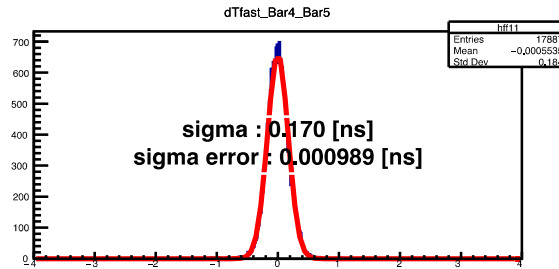
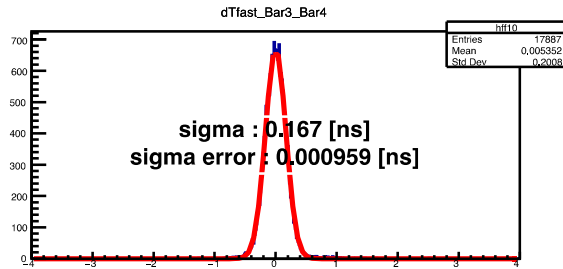


dTfast distribution fitting results

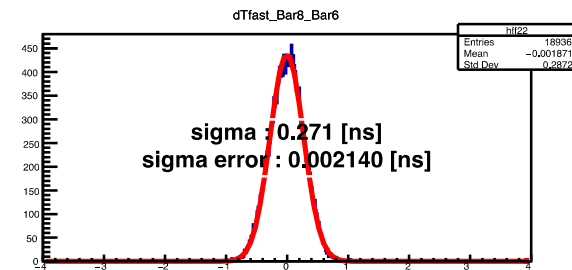
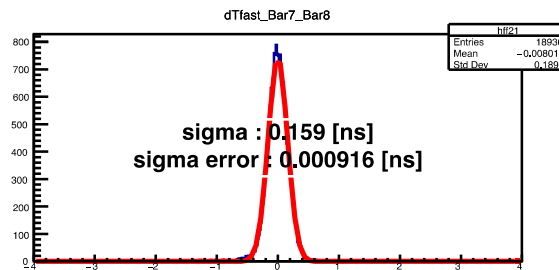
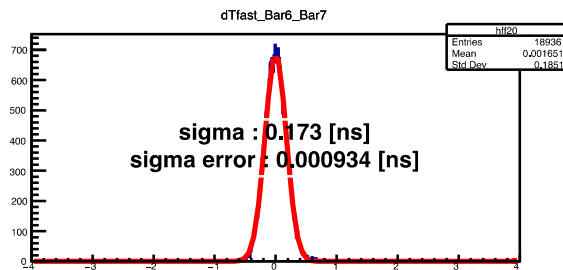
Run #151, at -80cm



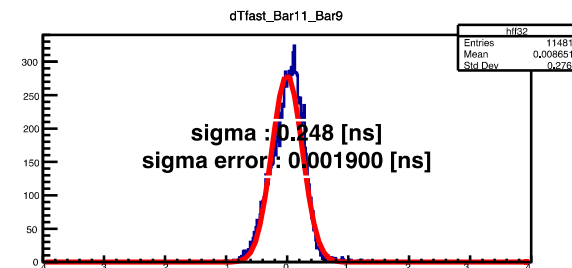
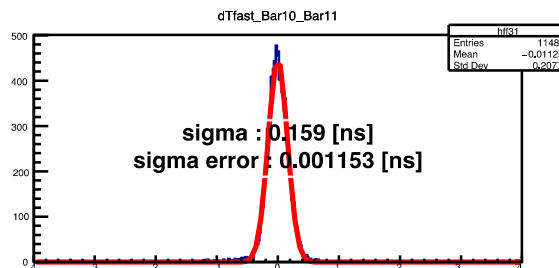
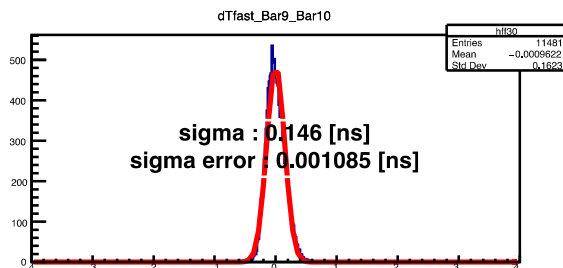
Group1



Group2



Group3



Group4

Time resolution

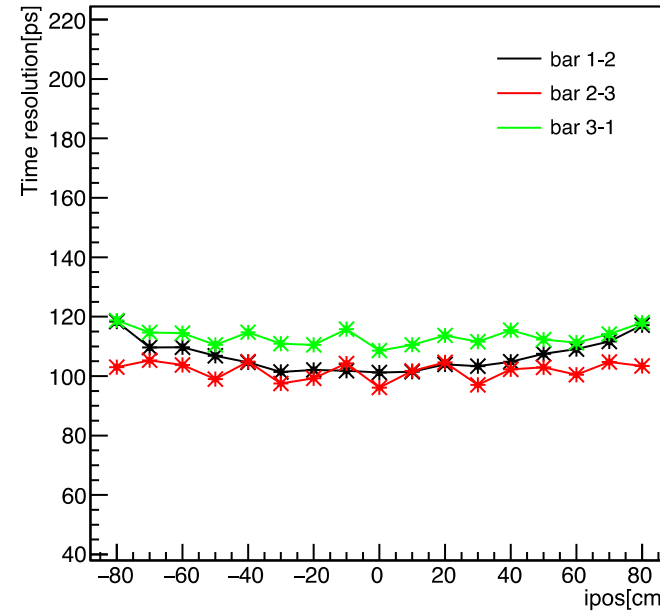
Group fitting results

Tmean analysis

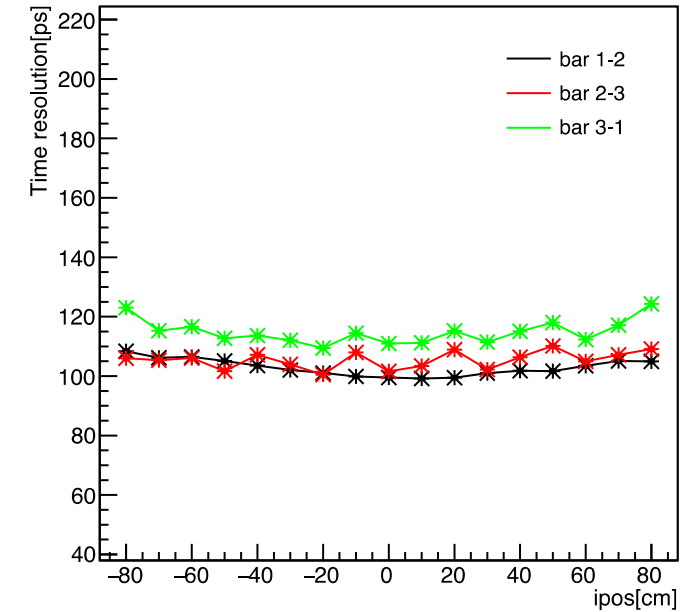
run#151

Tmean3 – Tmean1 distribution
usually has slightly larger sigma,
in each Group,
but doesn't look significant.

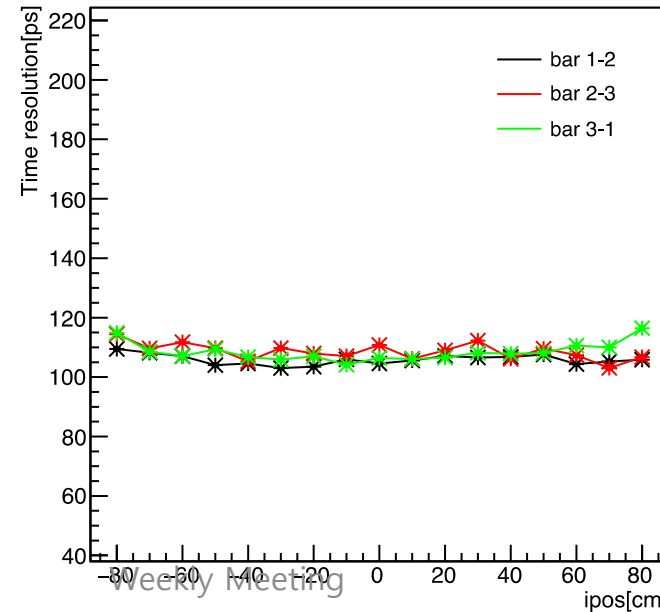
Run#151_Group1_Tmean



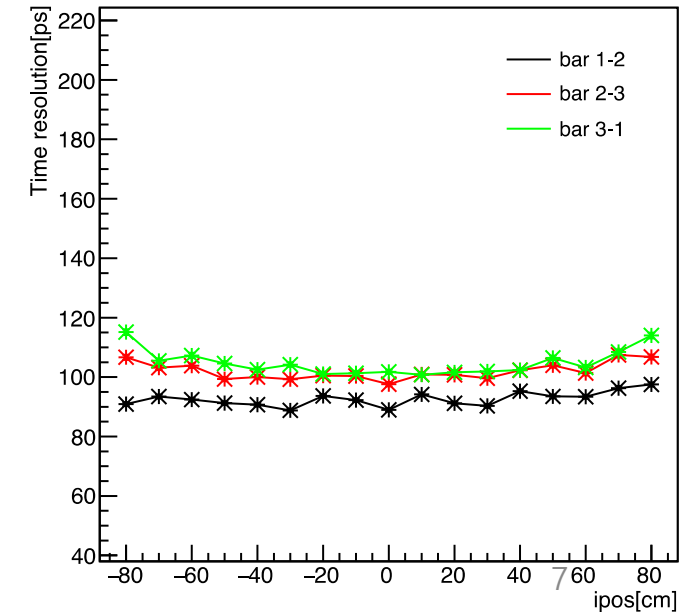
Run#151_Group2_Tmean



Run#151_Group3_Tmean



Run#151_Group4_Tmean



Time resolution

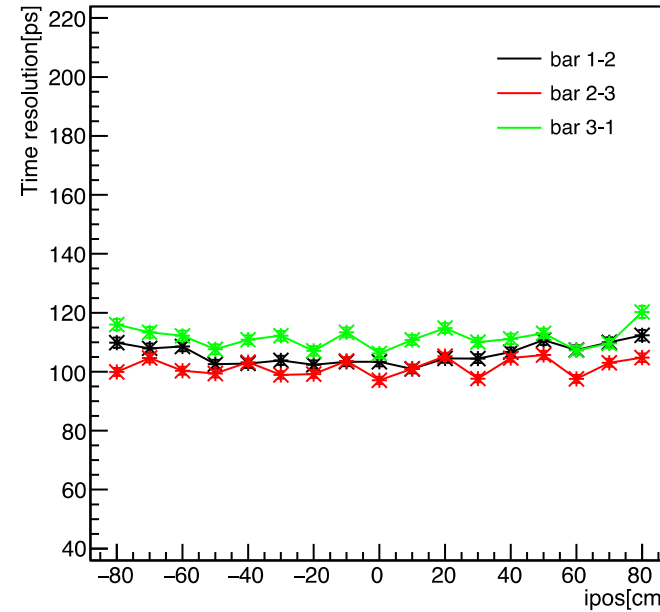
Group fitting results

Tmean analysis

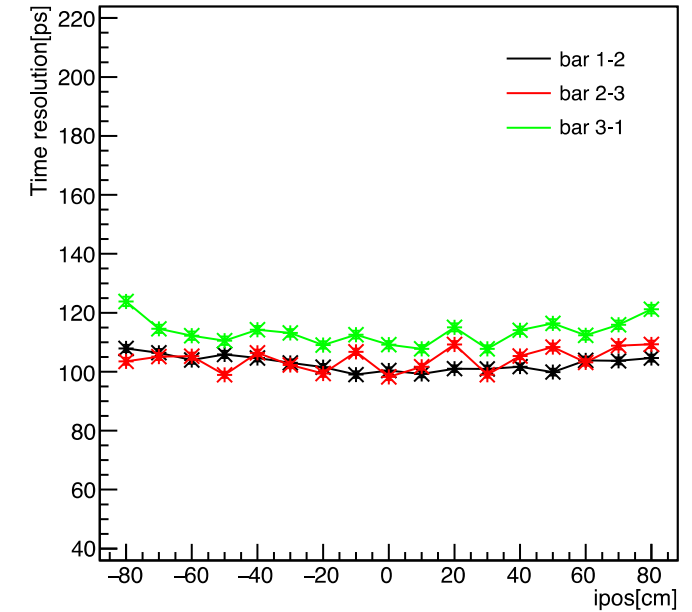
run#170

Tmean3 – Tmean1 distribution
usually has slightly larger sigma,
in each Group,
but doesn't look significant.

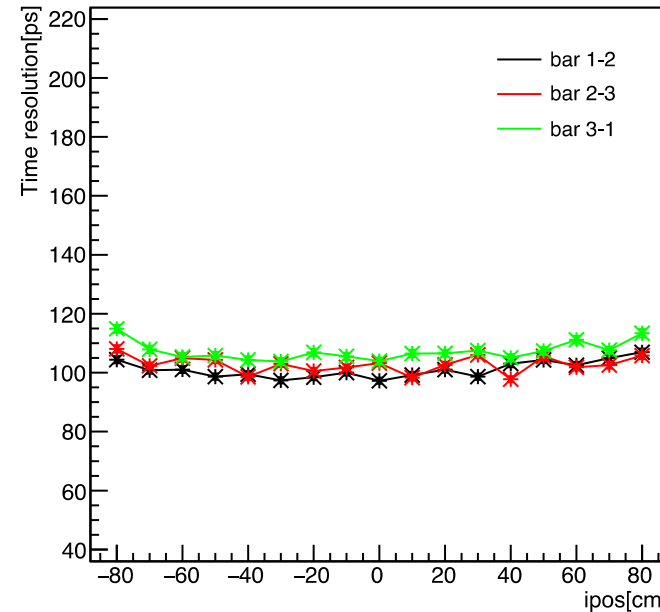
Run#170_Group1_Tmean



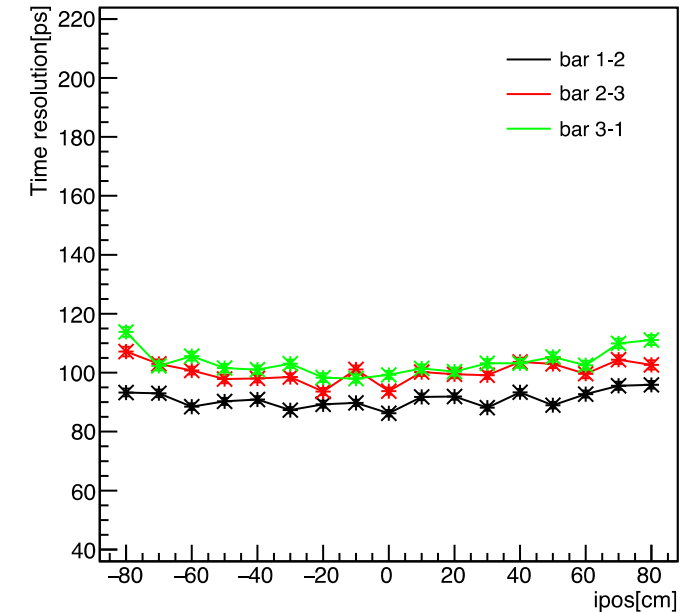
Run#170_Group2_Tmean



Run#170_Group3_Tmean



Run#170_Group4_Tmean



Time resolution

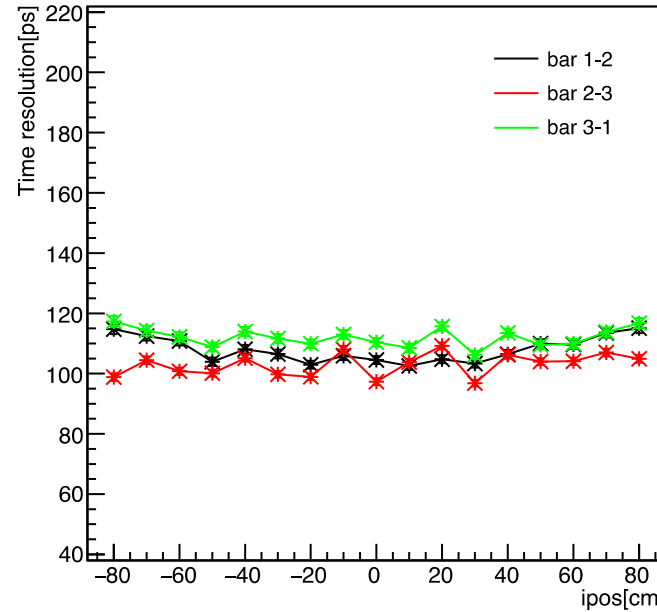
Group fitting results

Tmean analysis

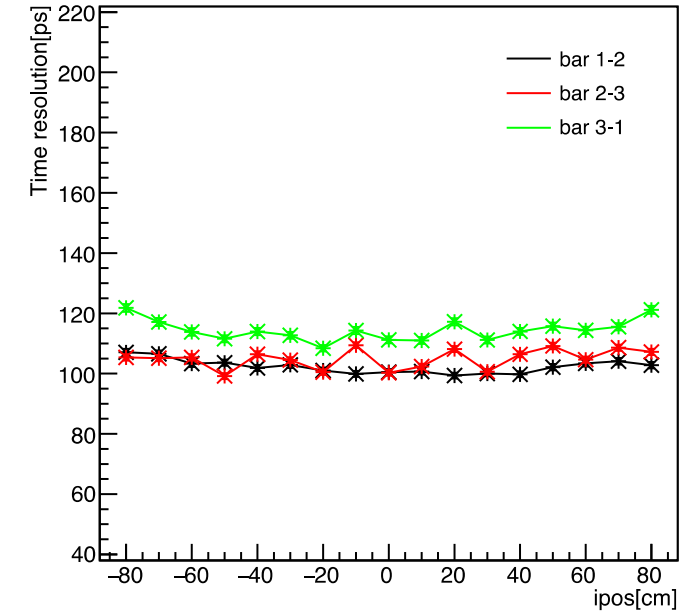
run#174

Tmean3 – Tmean1 distribution
usually has slightly larger sigma,
in each Group,
but doesn't look significant.

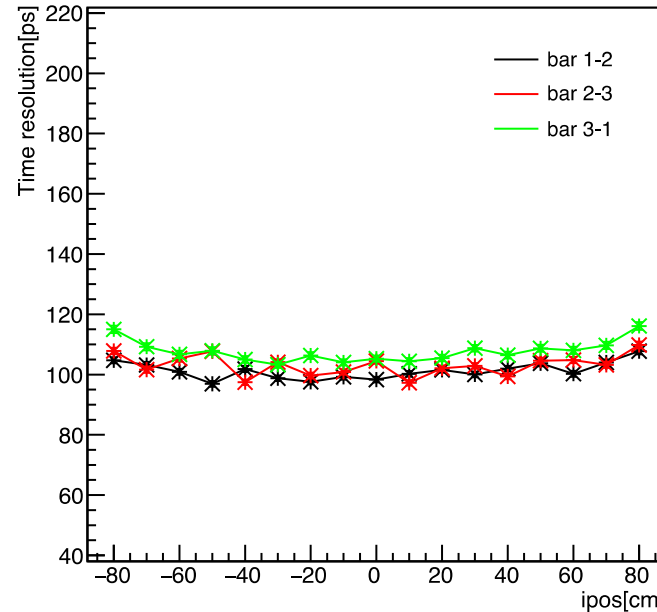
Run#174_Group1_Tmean



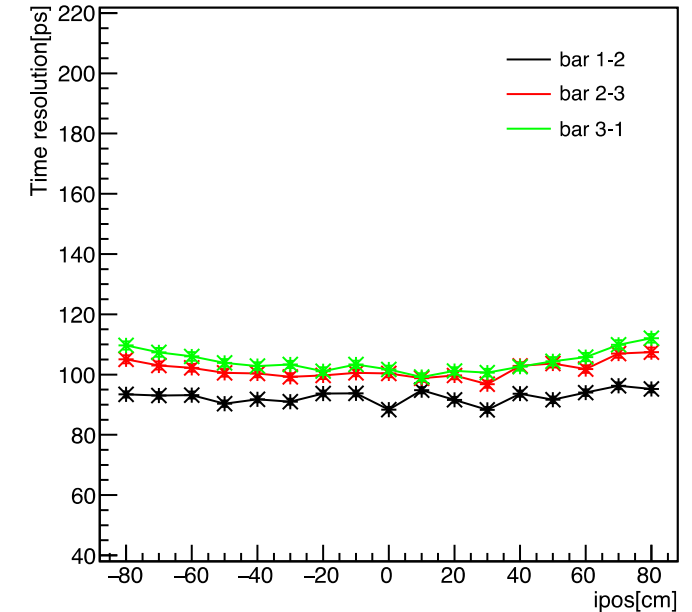
Run#174_Group2_Tmean



Run#174_Group3_Tmean



Run#174_Group4_Tmean



Time resolution

Group fitting results

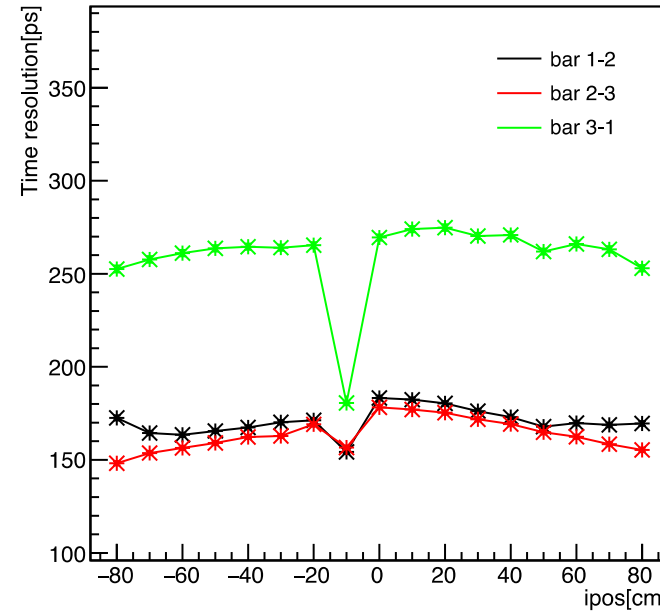
Tfast analysis

run#151

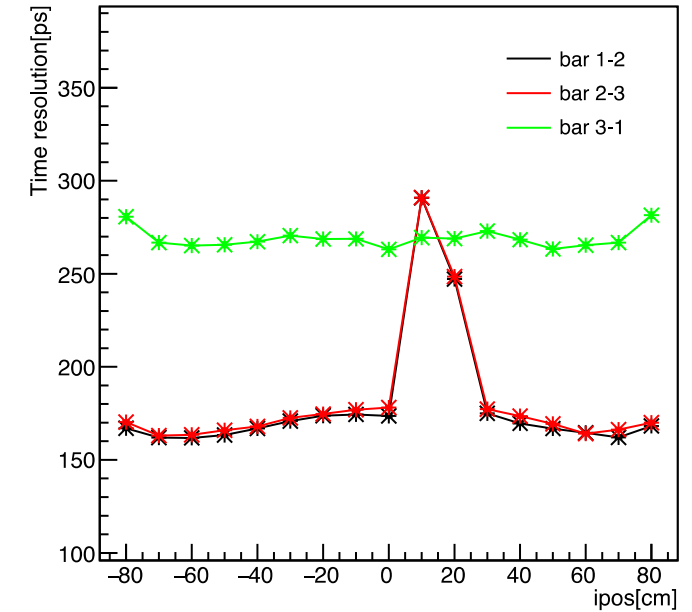
Tmean3 – Tmean1 distribution
usually has a lot bigger than rest.

BUT, near center of counter,
(-10cm, 0cm, +10cm)
it becomes smaller, while the
rests do bigger.

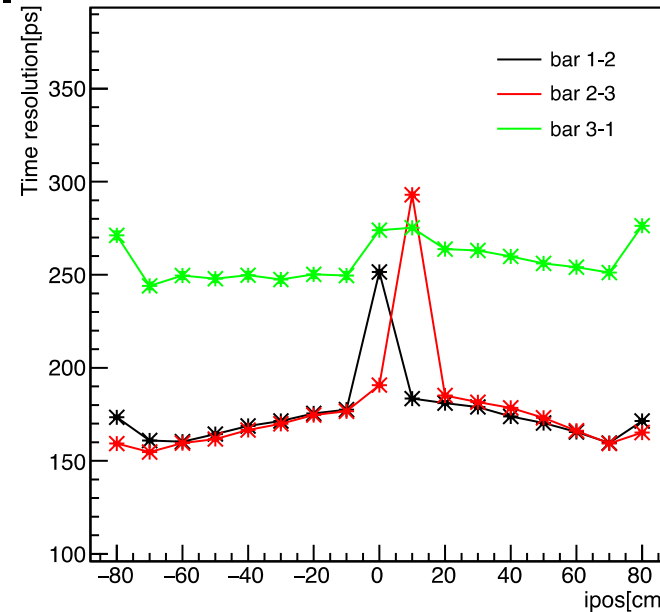
Run#151_Group1_Tfast



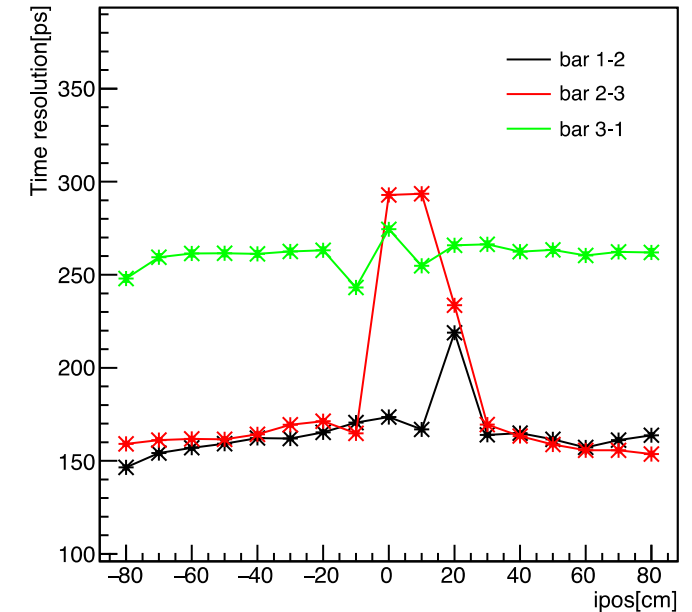
Run#151_Group2_Tfast



Run#151_Group3_Tfast



Run#151_Group4_Tfast



Time resolution

Group fitting results

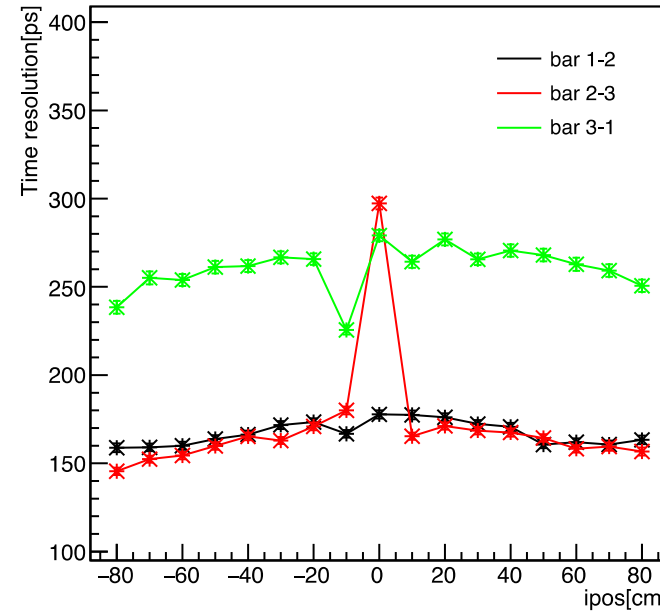
Tfast analysis

run#170

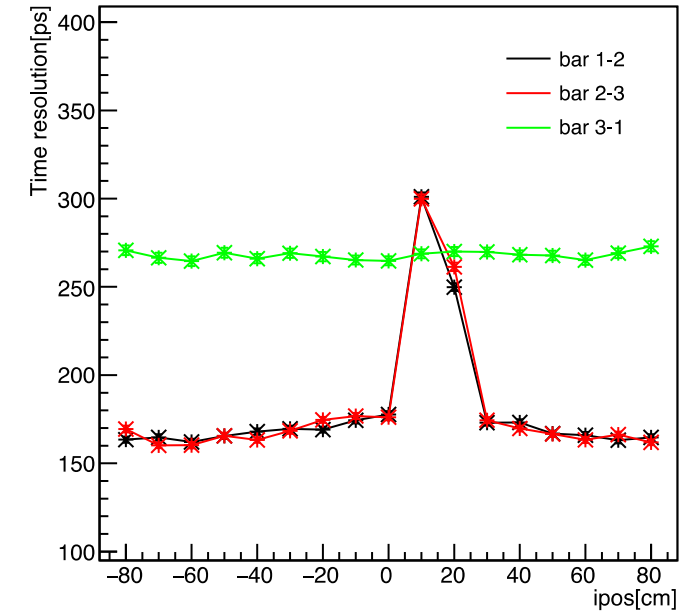
$T_{\text{mean3}} - T_{\text{mean1}}$ distribution usually has a lot bigger than rest.

BUT, near center of counter, (-10cm, 0cm, +10cm) it becomes smaller, while the rests do bigger.

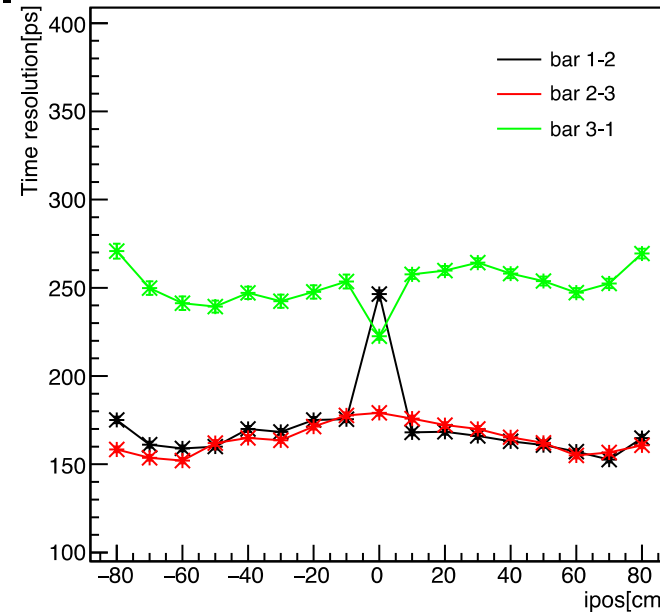
Run#170_Group1_Tfast



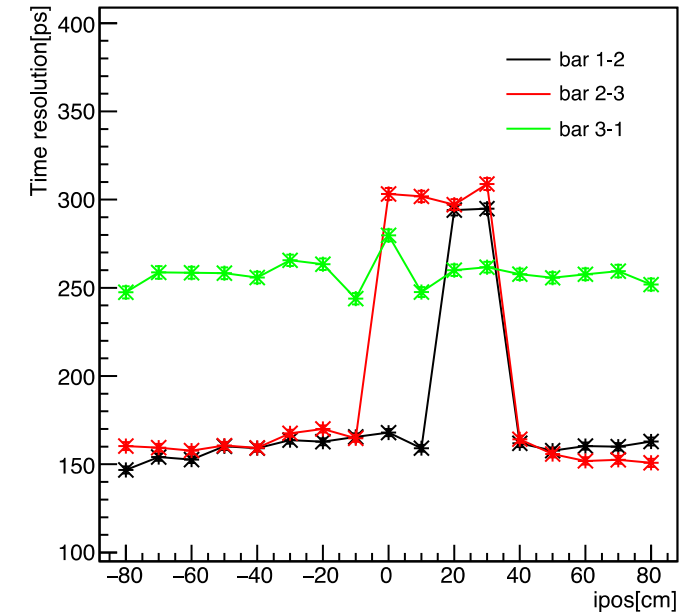
Run#170_Group2_Tfast



Run#170_Group3_Tfast



Run#170_Group4_Tfast



Time resolution

Group fitting results

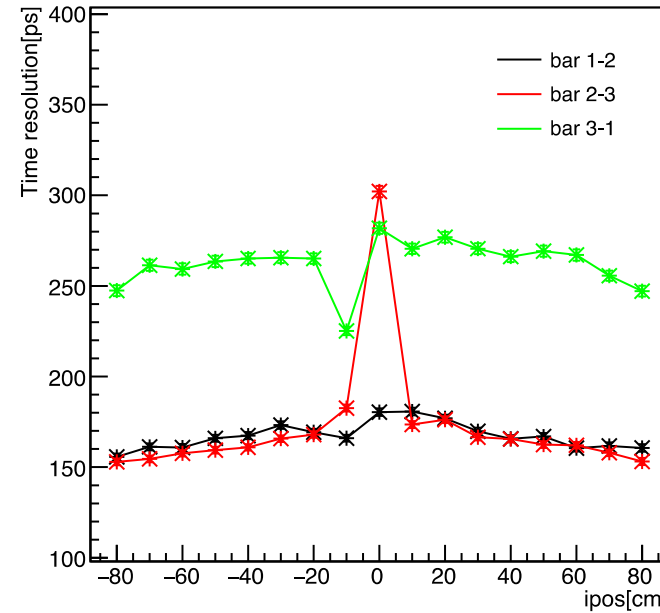
Tfast analysis

run#174

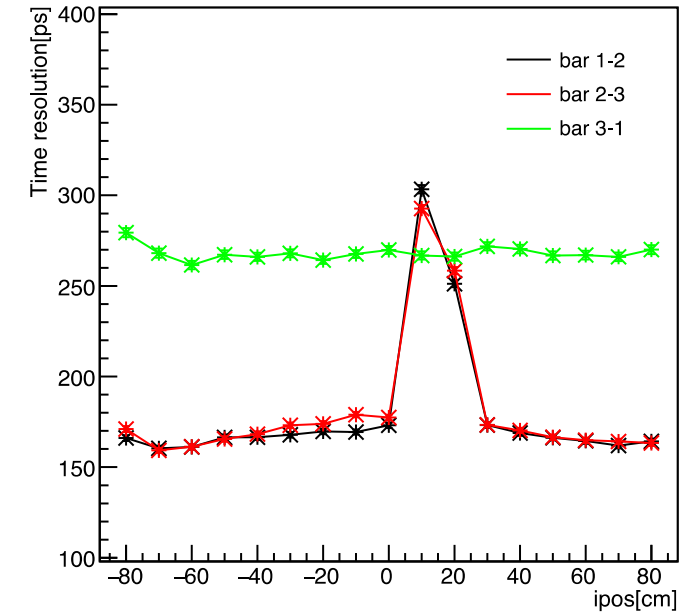
Tmean3 – Tmean1 distribution
usually has a lot bigger than rest

BUT, near center of counter,
(-10cm, 0cm, +10cm)
it becomes smaller, while the
rests do bigger.

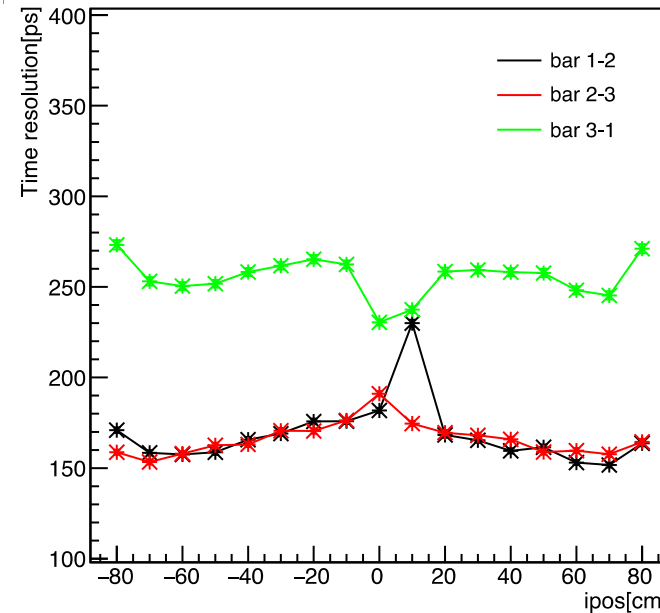
Run#174_Group1_Tfast



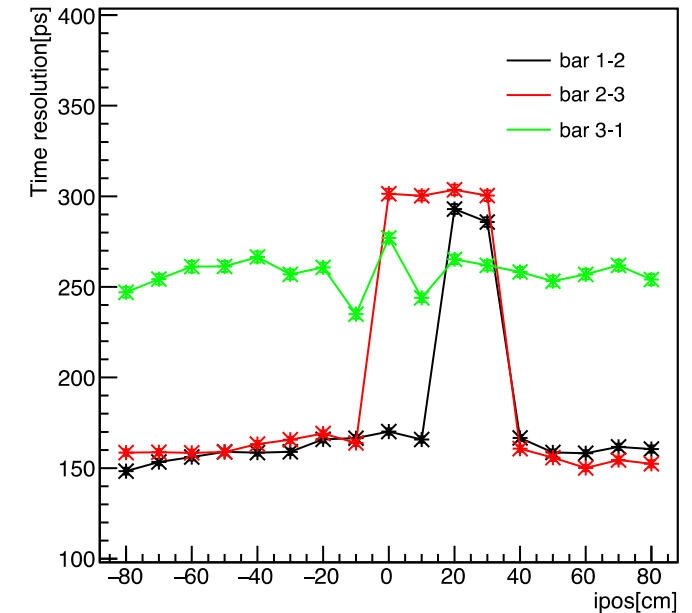
Run#174_Group2_Tfast



Run#174_Group3_Tfast



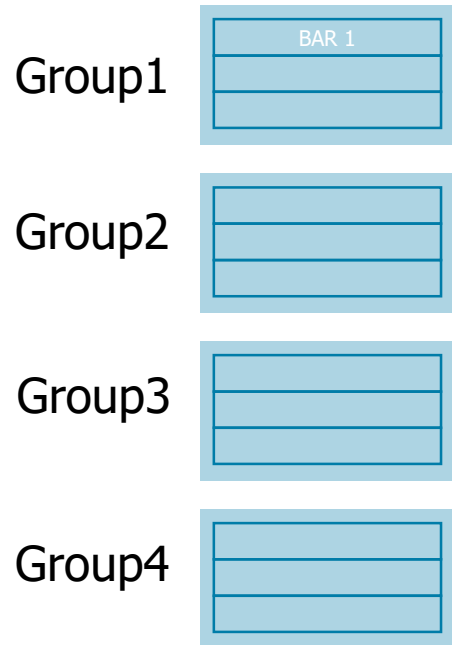
Run#174_Group4_Tfast



Time resolution

On various angle – analysis method

1. Grouping



2. Region incident angle

Linear fit with 3 hit positions,
and obtain the incident angle of event.

Select events when the angles is
within specific range we want.

1. $|\theta| < 45^\circ$
2. $|\theta| > 45^\circ$

3. dT distribution fitting & Reducing

$$\begin{aligned}dTmean_\alpha &= Tmean_1 - Tmean_2 \\dTmean_\beta &= Tmean_2 - Tmean_3 \\dTmean_\gamma &= Tmean_3 - Tmean_1\end{aligned}$$

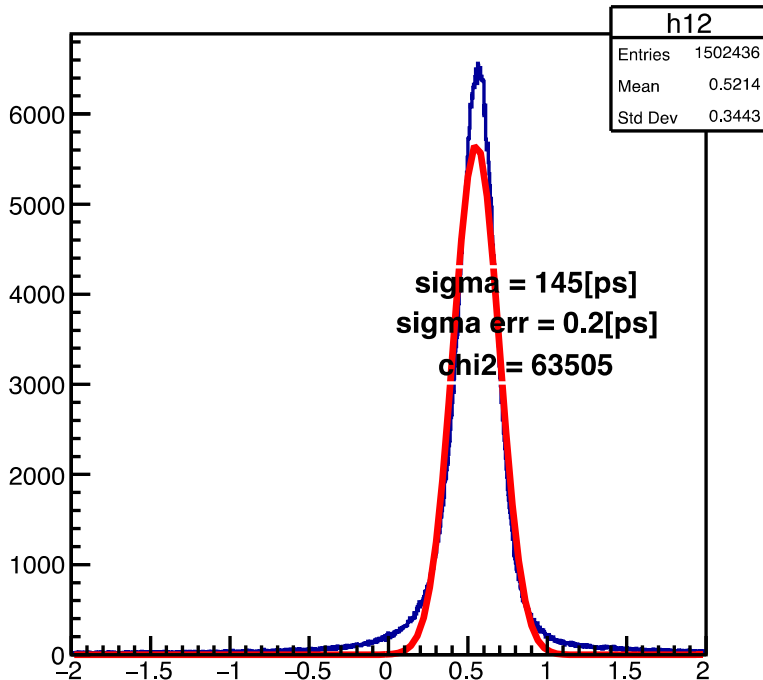
$$\begin{aligned}\sigma_\alpha^2 &= \sigma_1^2 + \sigma_2^2 \\ \longrightarrow \sigma_\beta^2 &= \sigma_2^2 + \sigma_3^2 \\ \sigma_\gamma^2 &= \sigma_3^2 + \sigma_1^2\end{aligned}$$

Time resolution

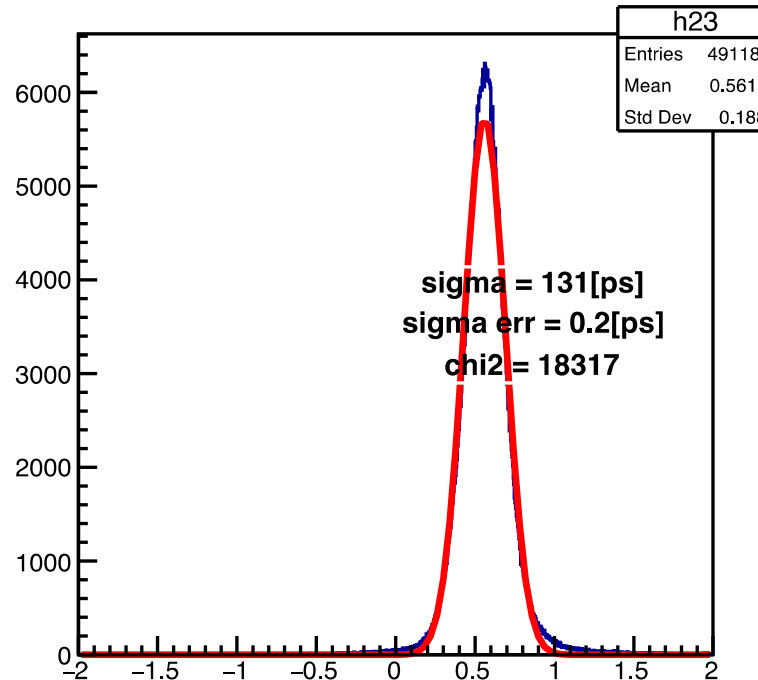
With angle cut

Run #151, Group1, Tmean1 – Tmean3

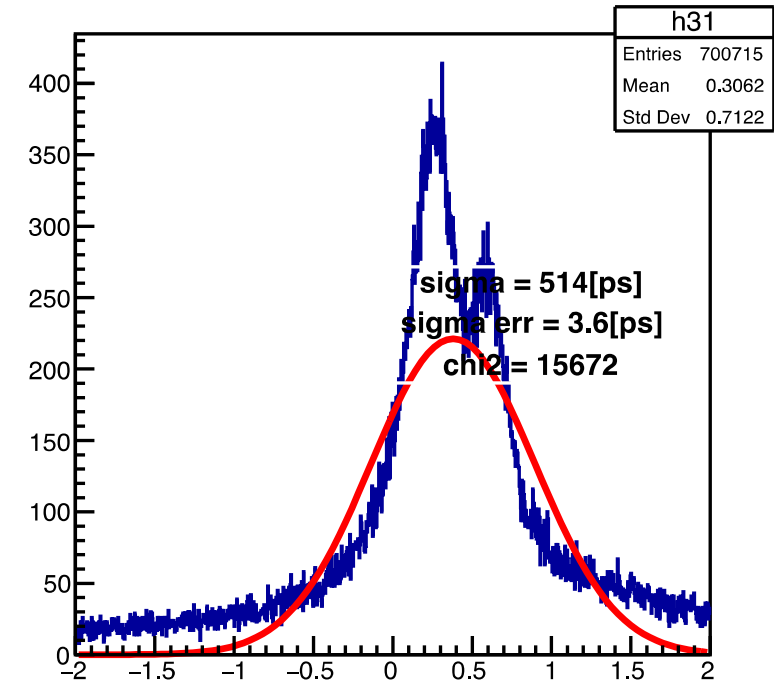
Tmean3 - Tmean1



When (Theta) < 45



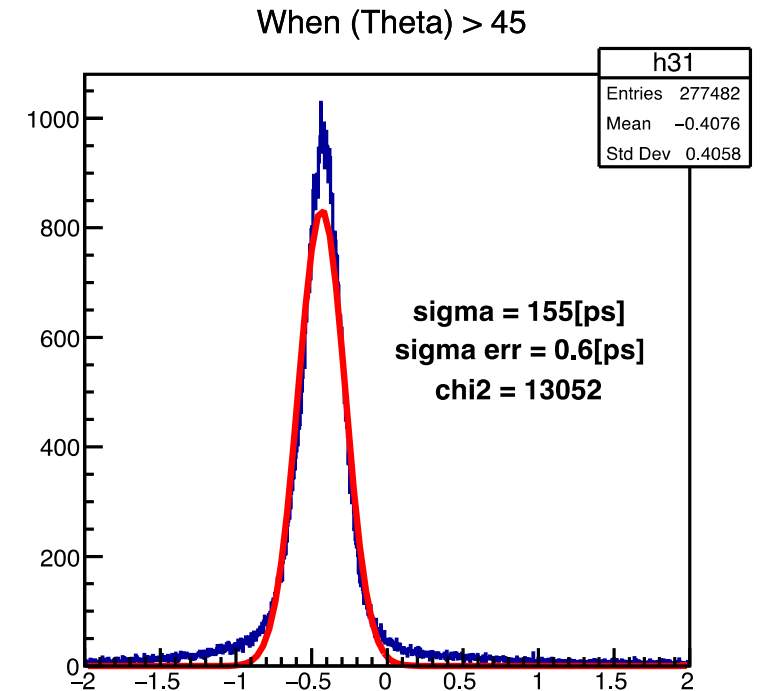
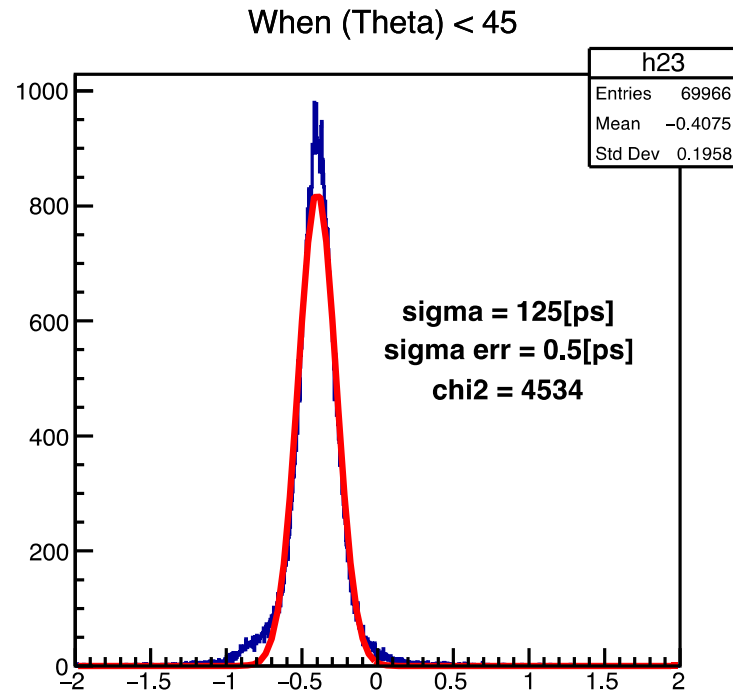
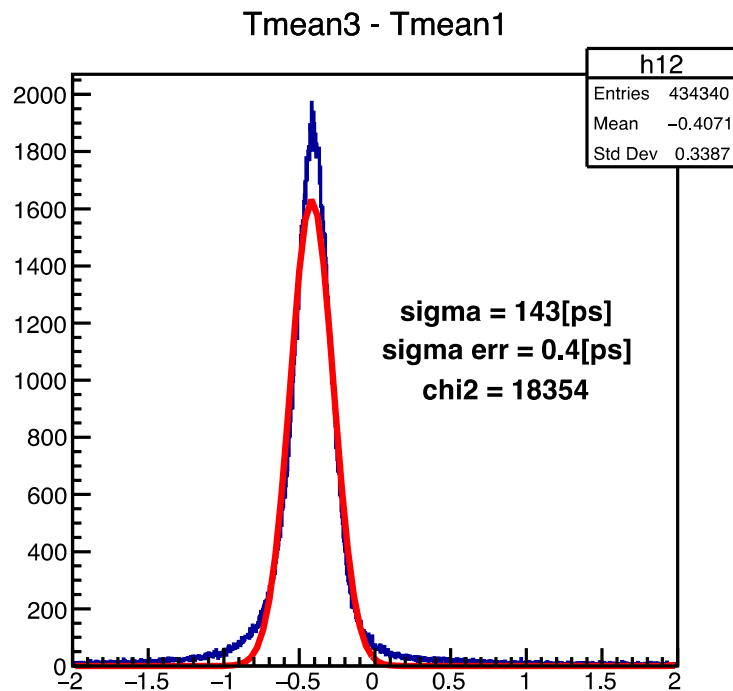
When (Theta) > 45



Time resolution

With angle cut

Run #170, Group1, Tmean1 – Tmean3



Time resolution

With angle cut

Run #174, Group1, Tmean1 – Tmean3

