haul meeting

Hodoscope report

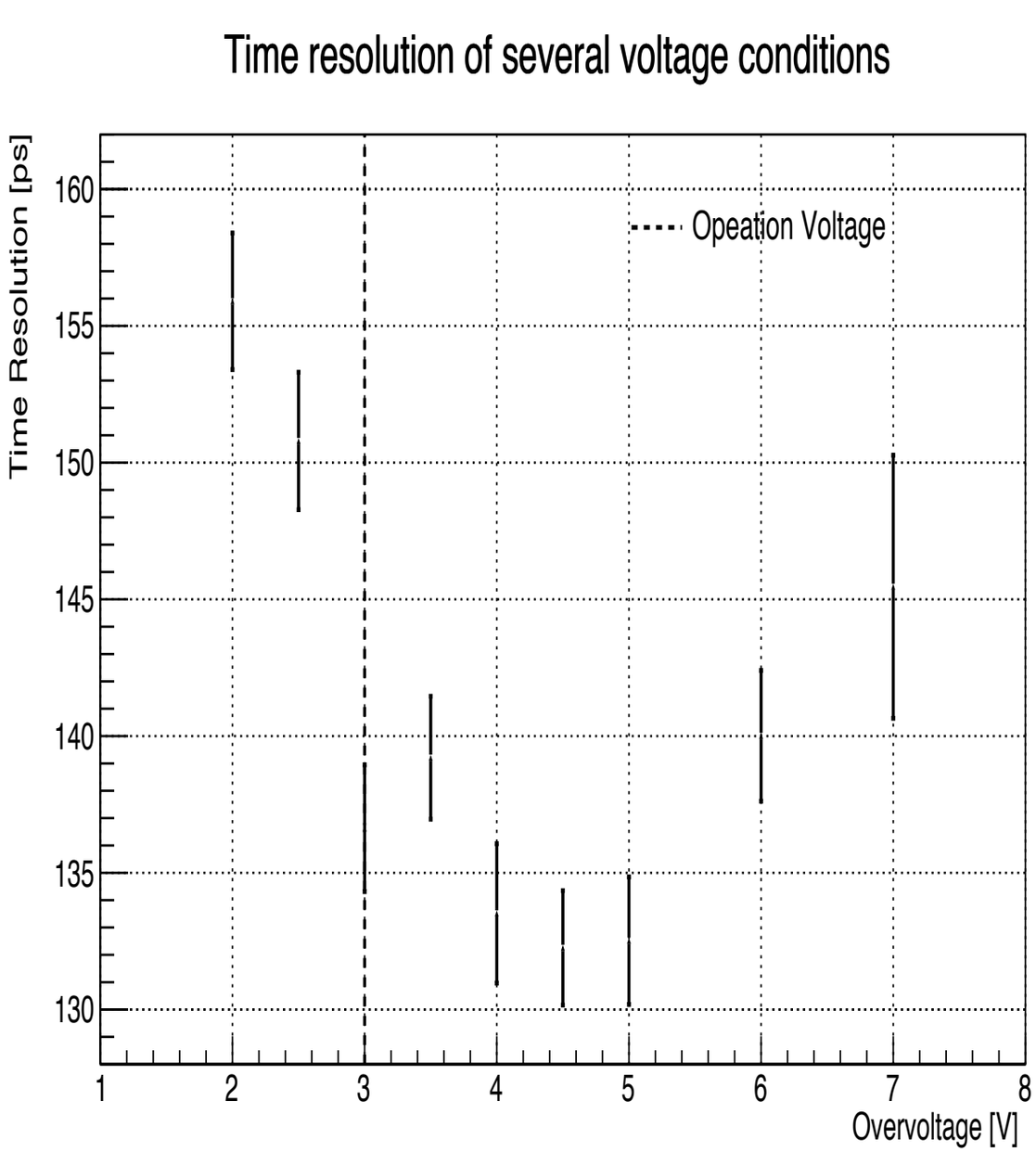
Korea Univ.
Wooseung Jung

EJ-232 w/ or w/o LG

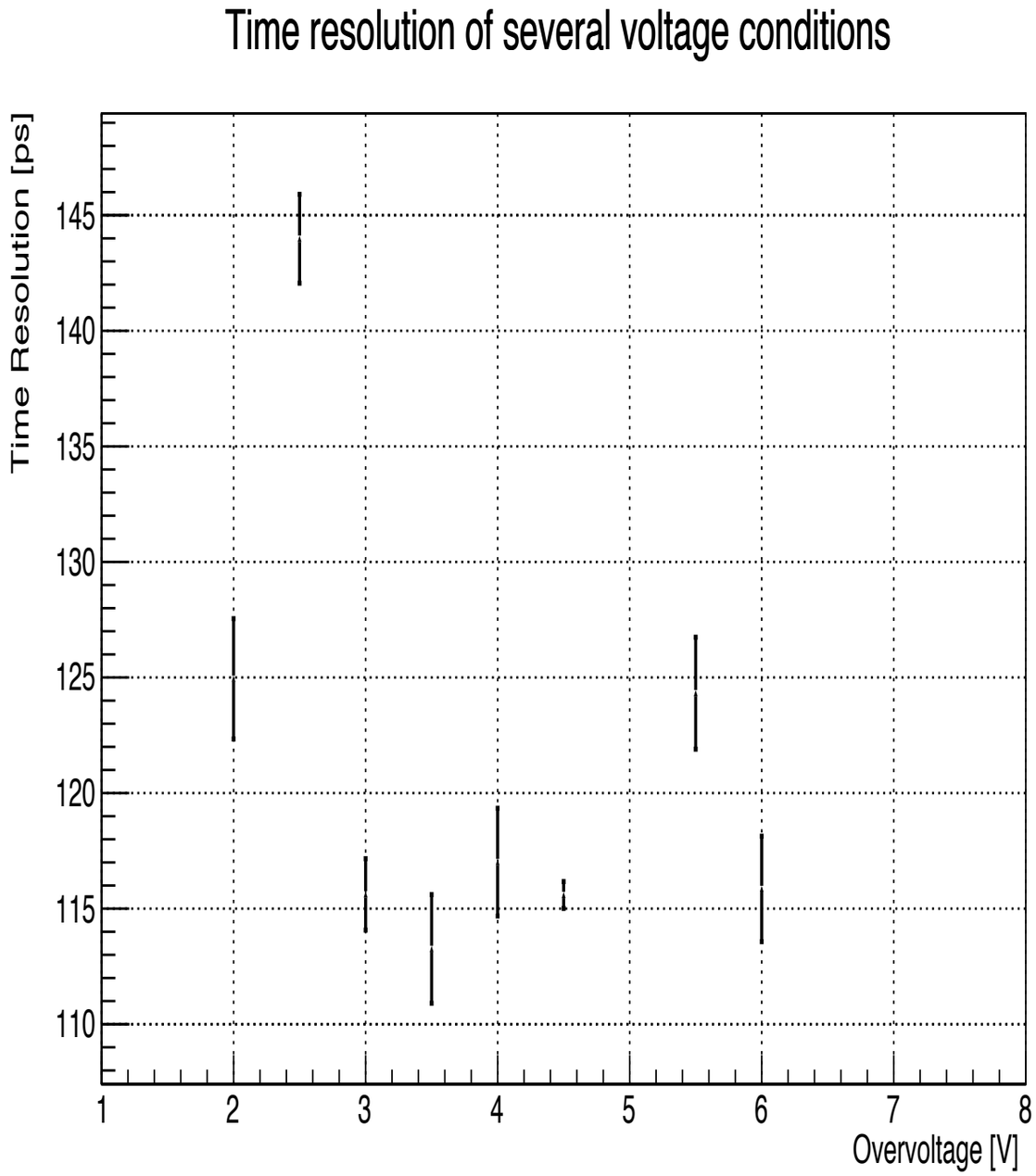
Bias voltage dependence

BIAS VOLTAGE DEPENDENCE

EJ-232 w/o LG

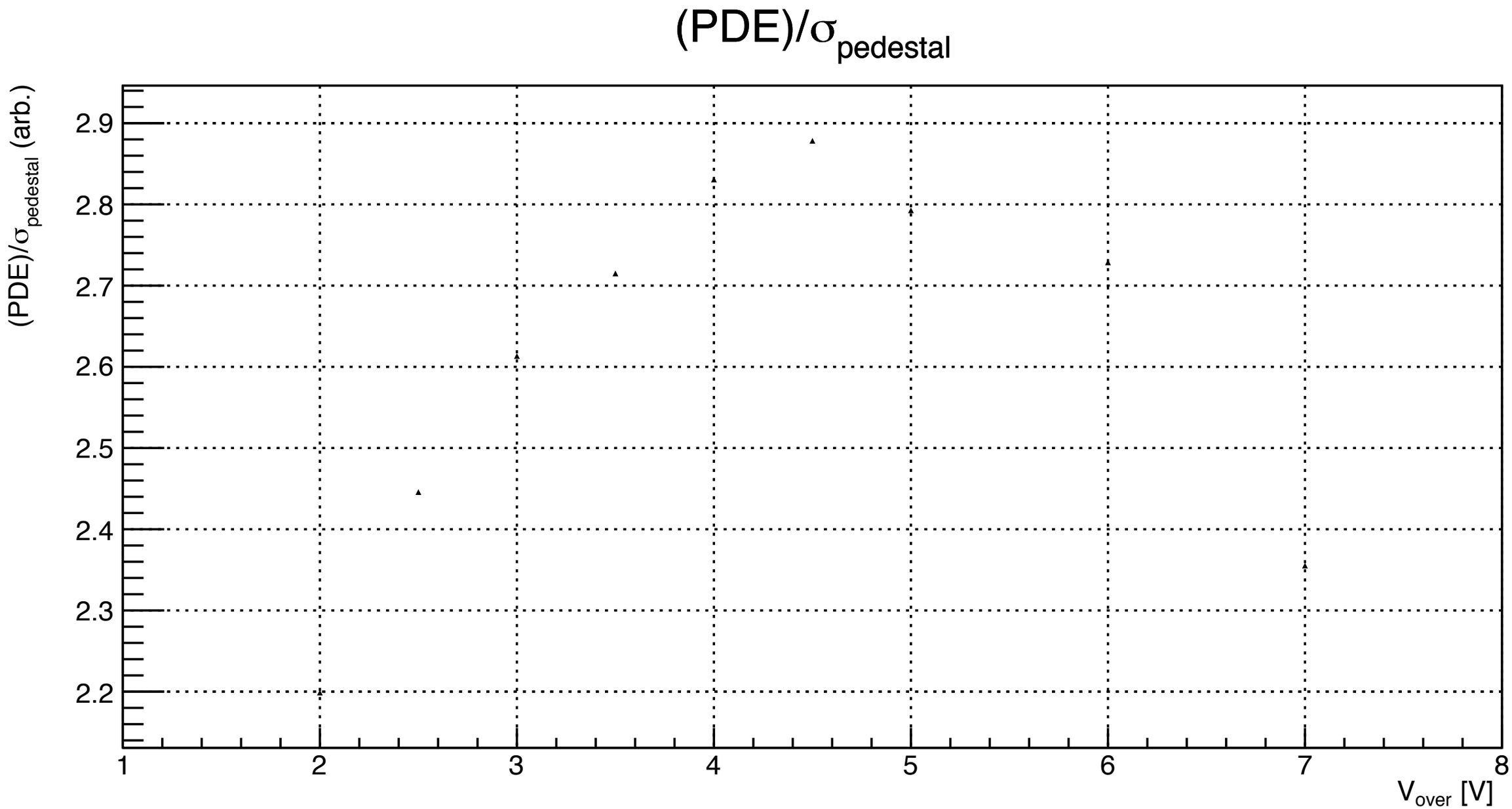


EJ-232 w/ LG



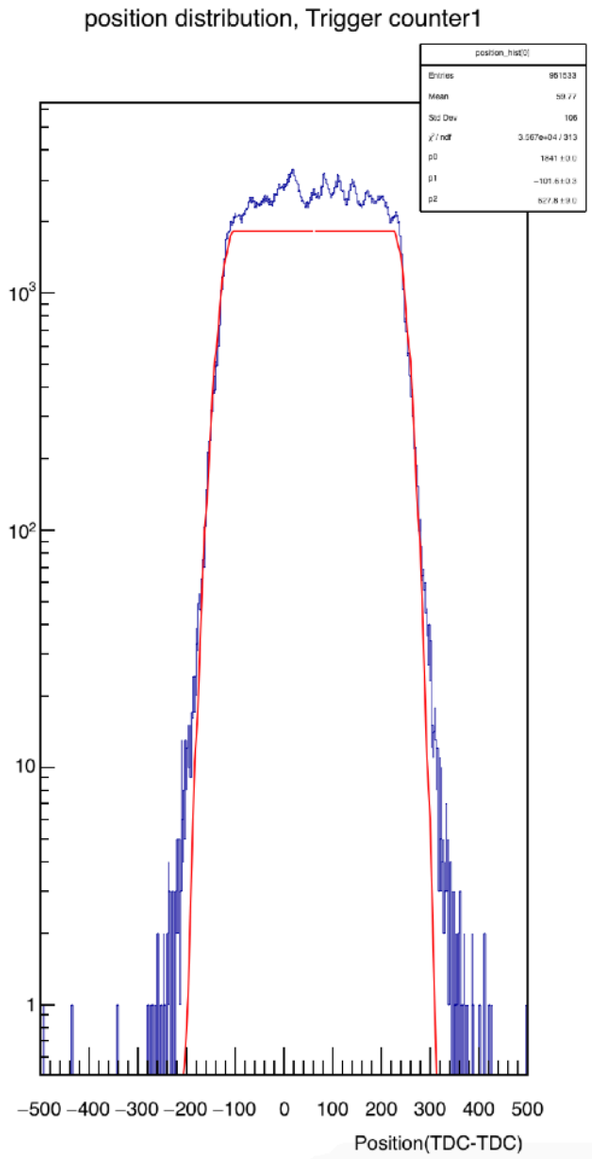
BIAS VOLTAGE DEPENDENCE

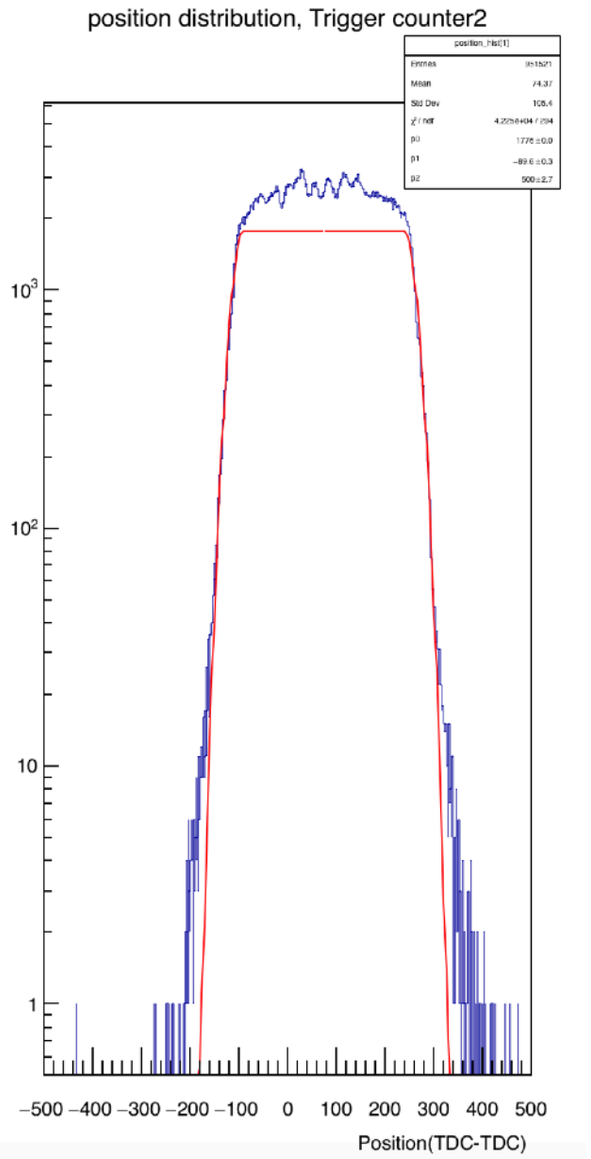
EJ-232 w/o LG



position dependence

POSITION DEPENDENCE



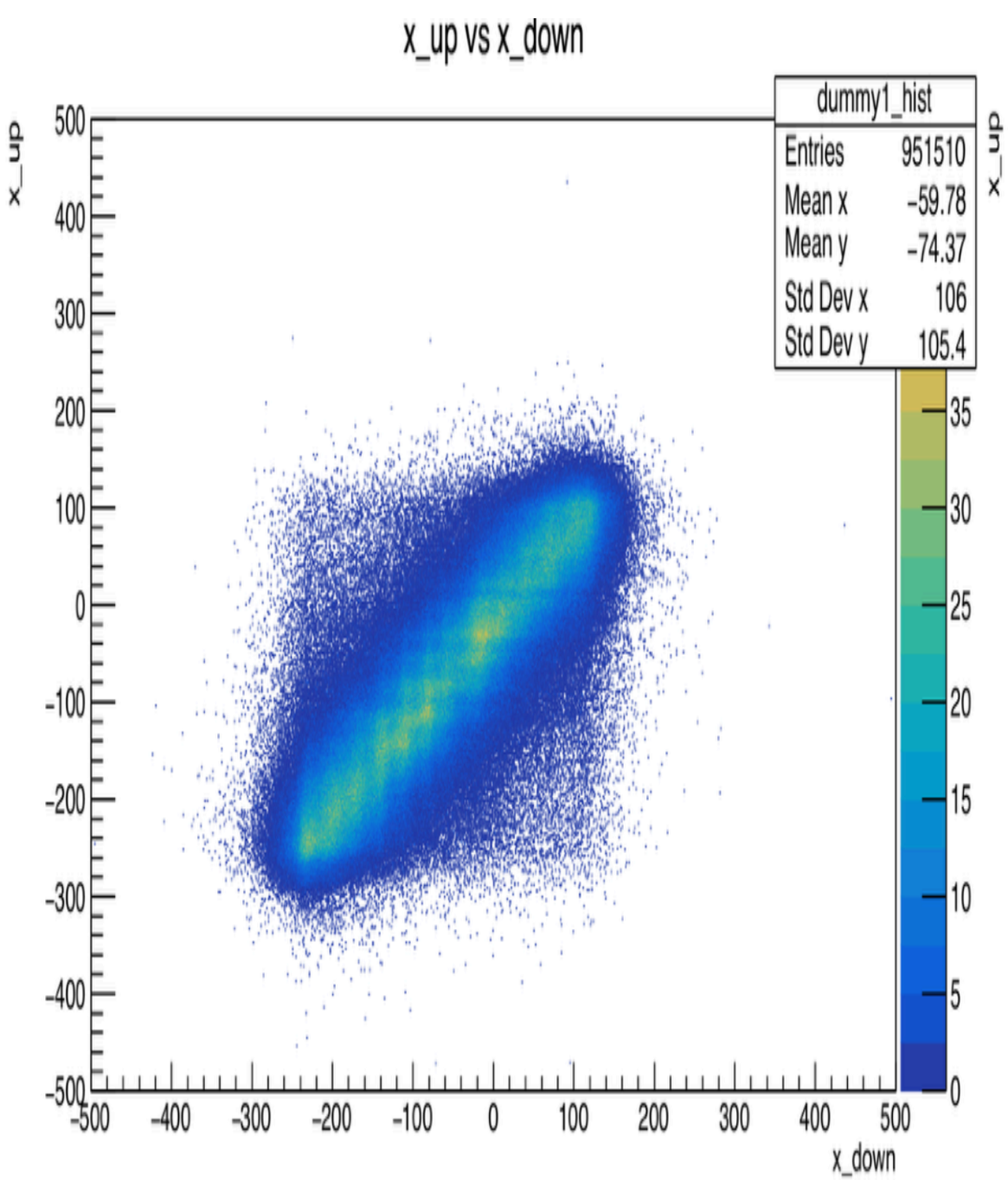


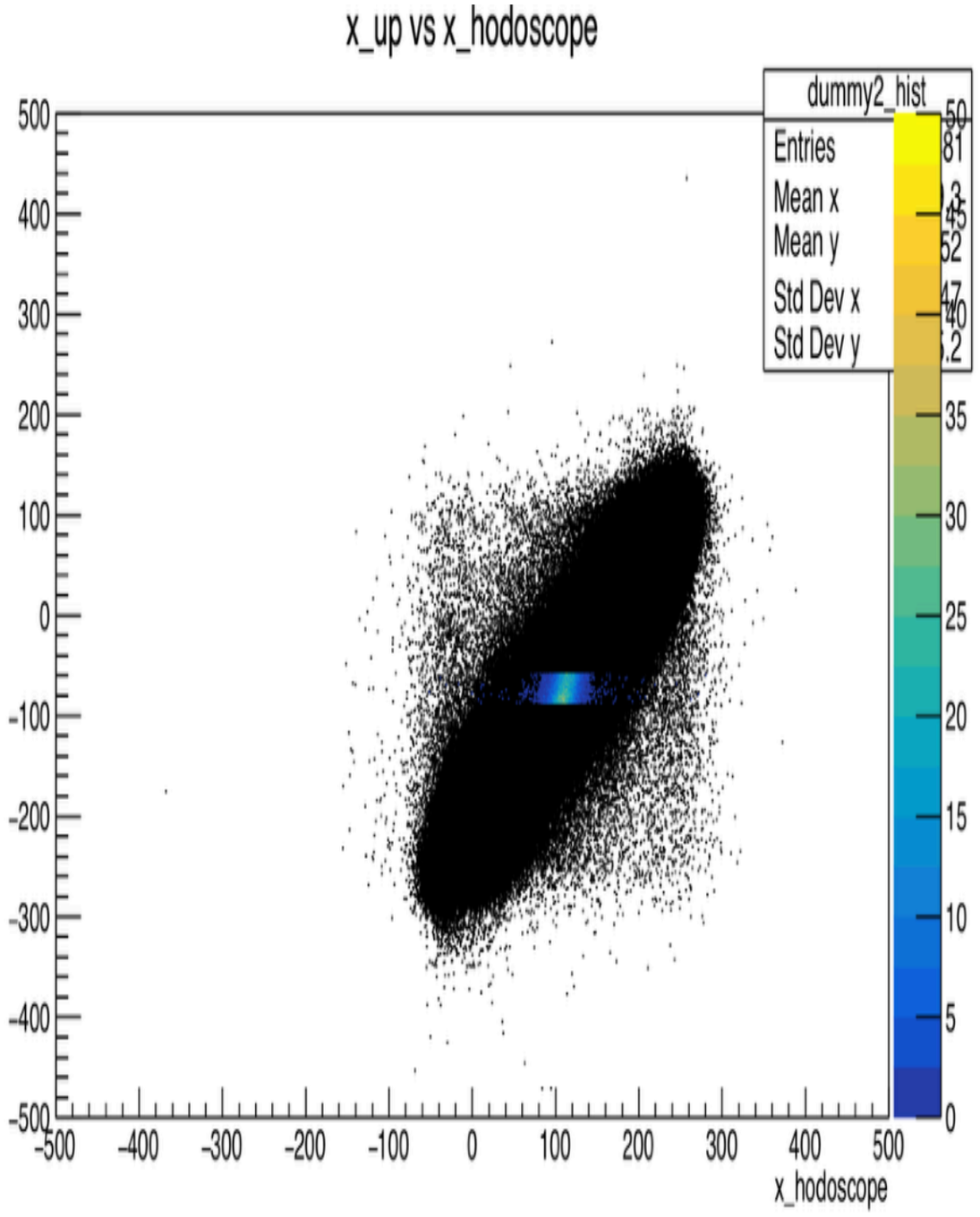
Fitting functions

$$p_0 exp[-\frac{(min(z,p_1)-p_1)^2}{2p_2^2}]$$

$$p_0 exp[-\frac{(max(z,p_1)-p_1)^2}{2p_2^2}]$$

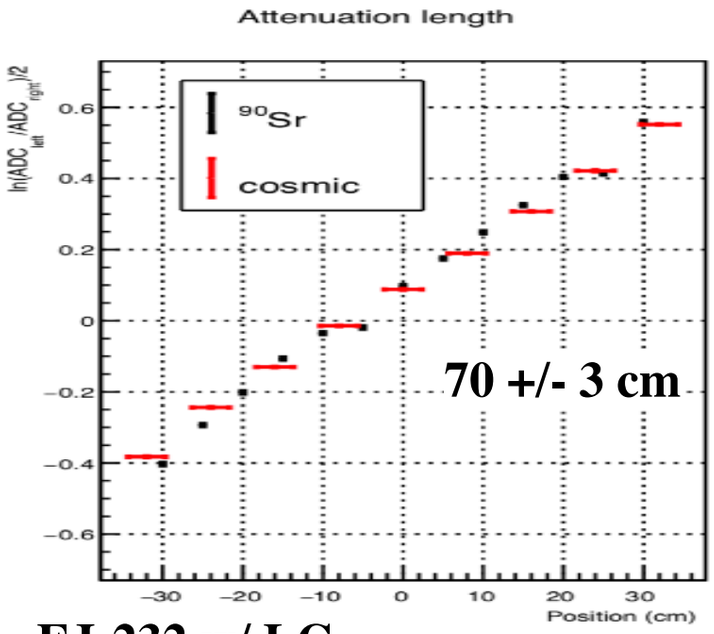
POSITION DEPENDENCE

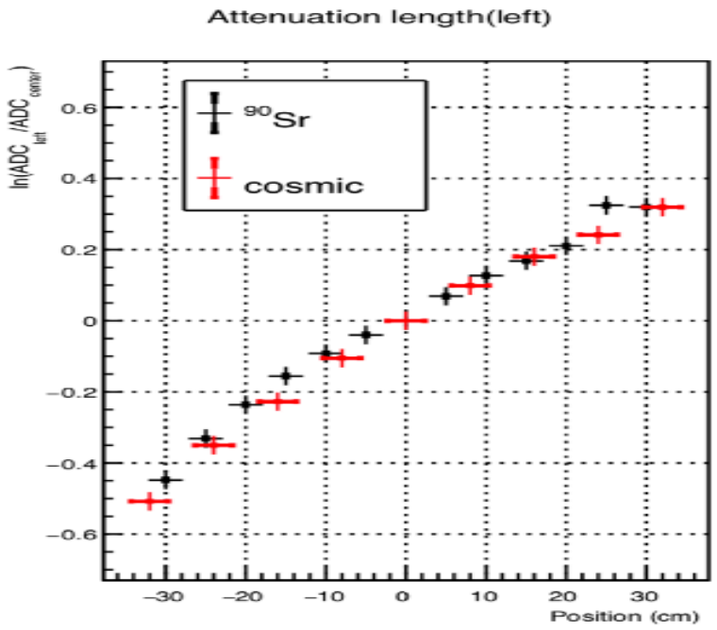


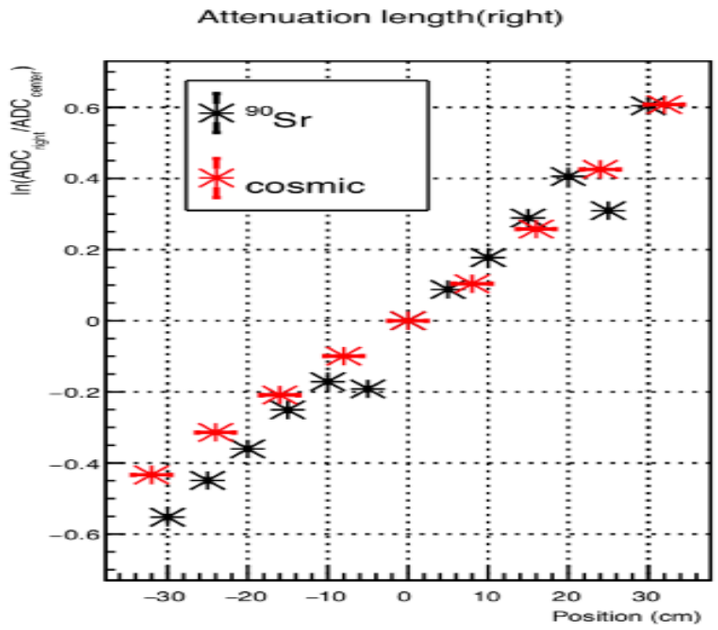


POSITION DEPENDENCE

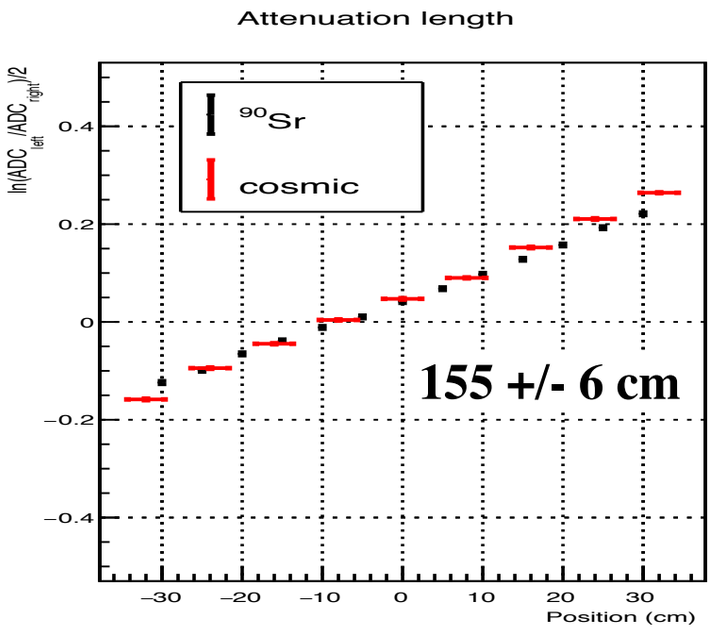
EJ-232 w/o LG

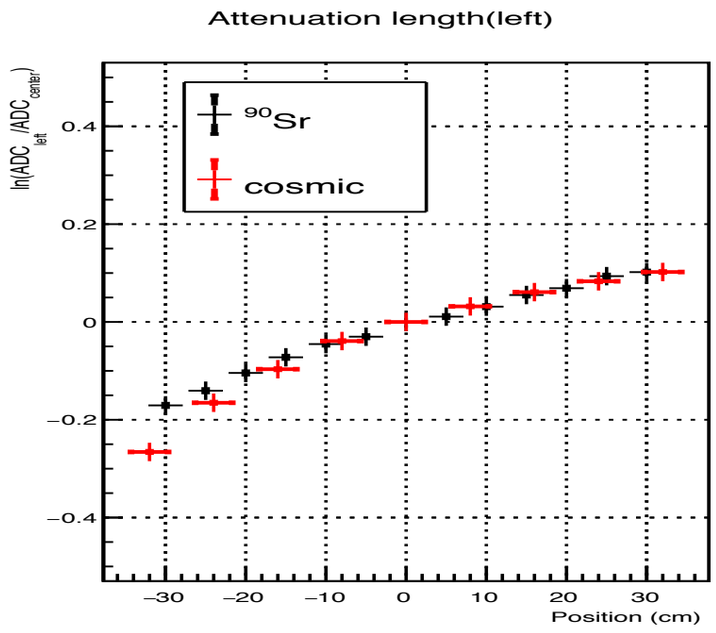


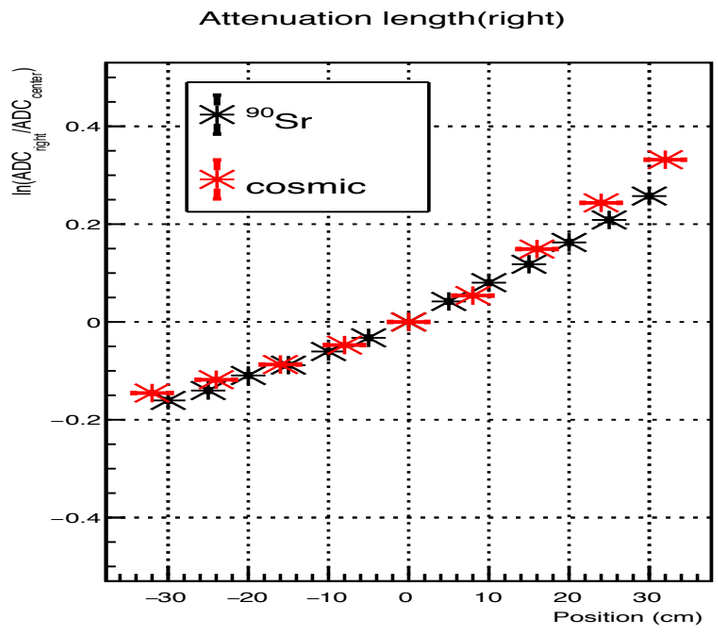




EJ-232 w/ LG

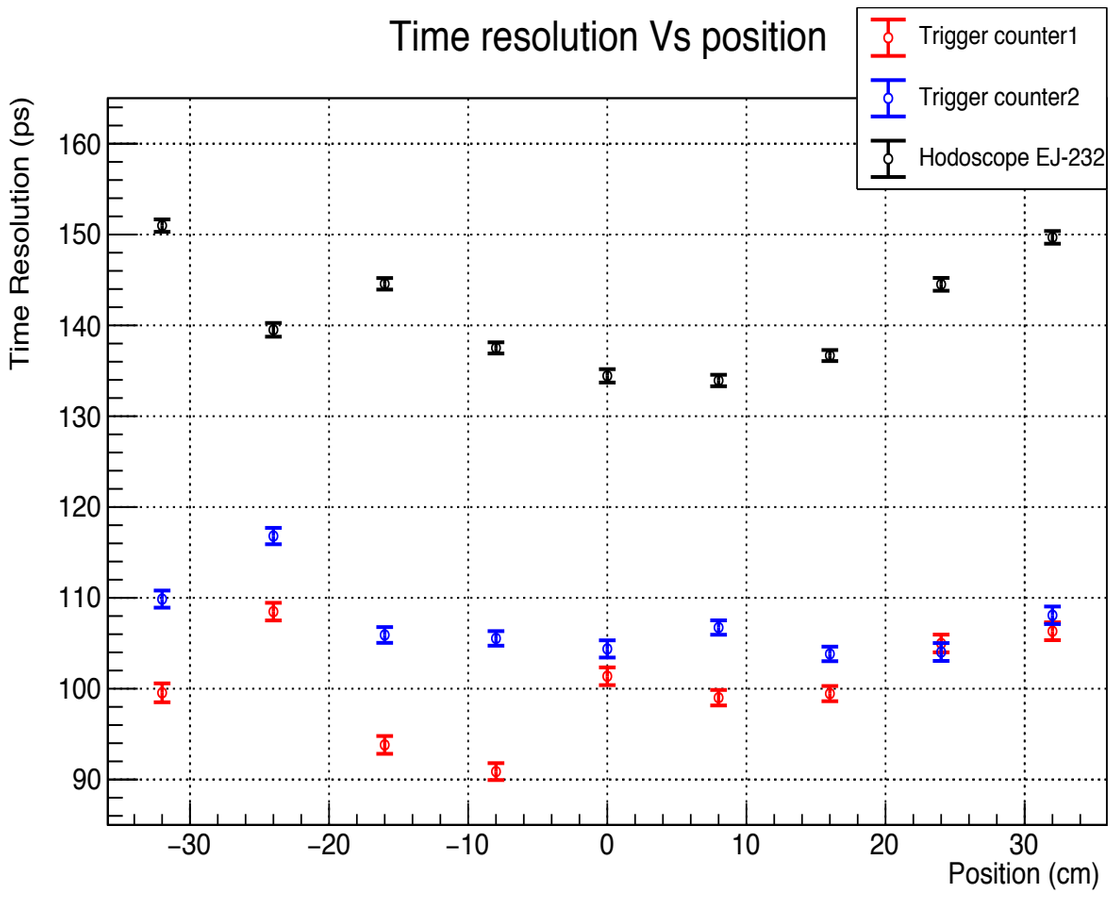


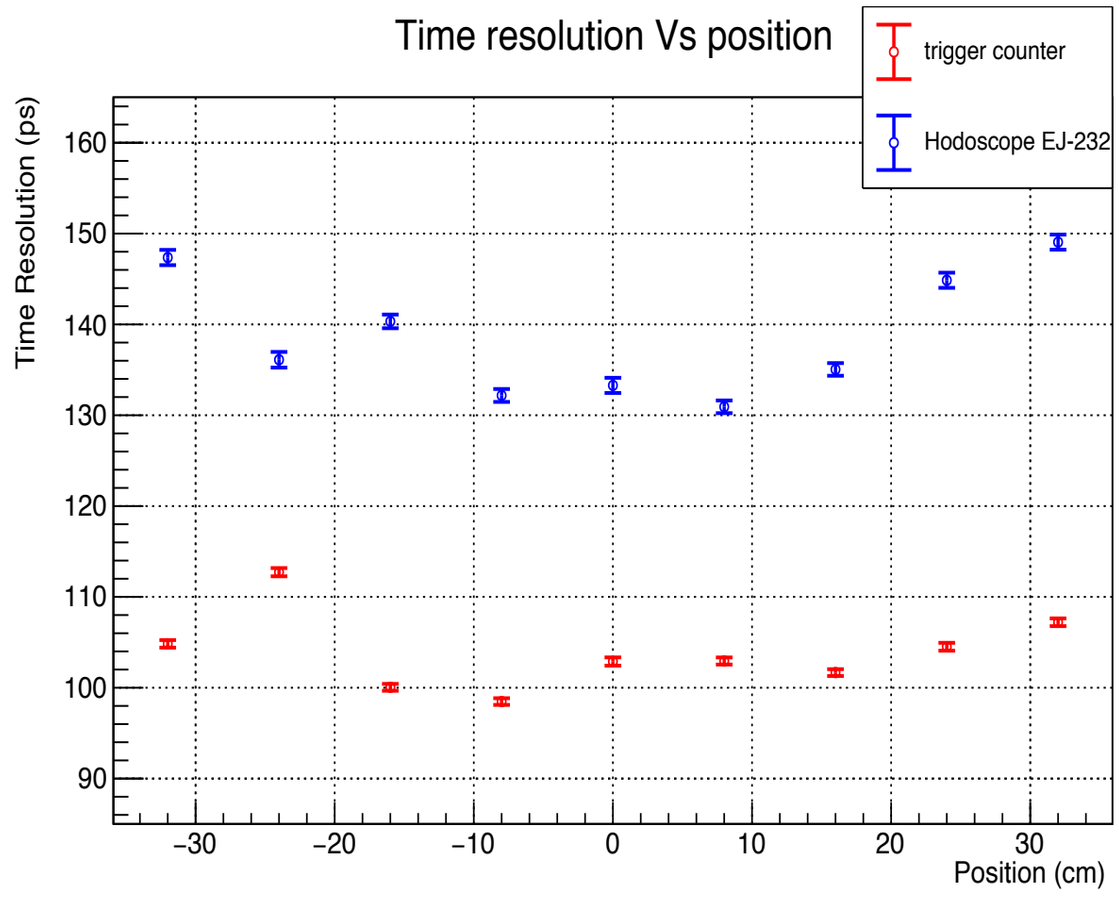




POSITION DEPENDENCE

The time resolution change by location is within 15%.

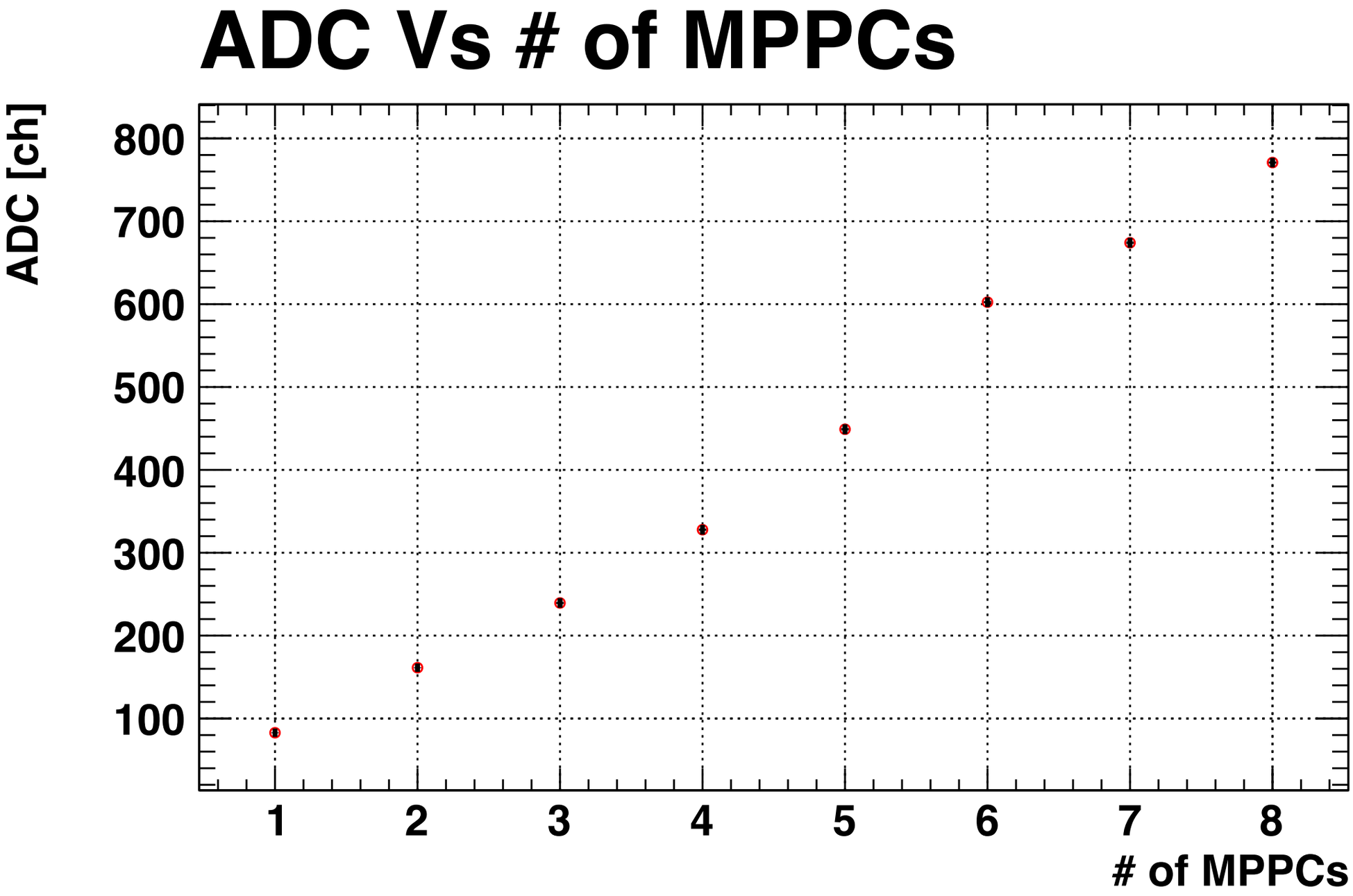




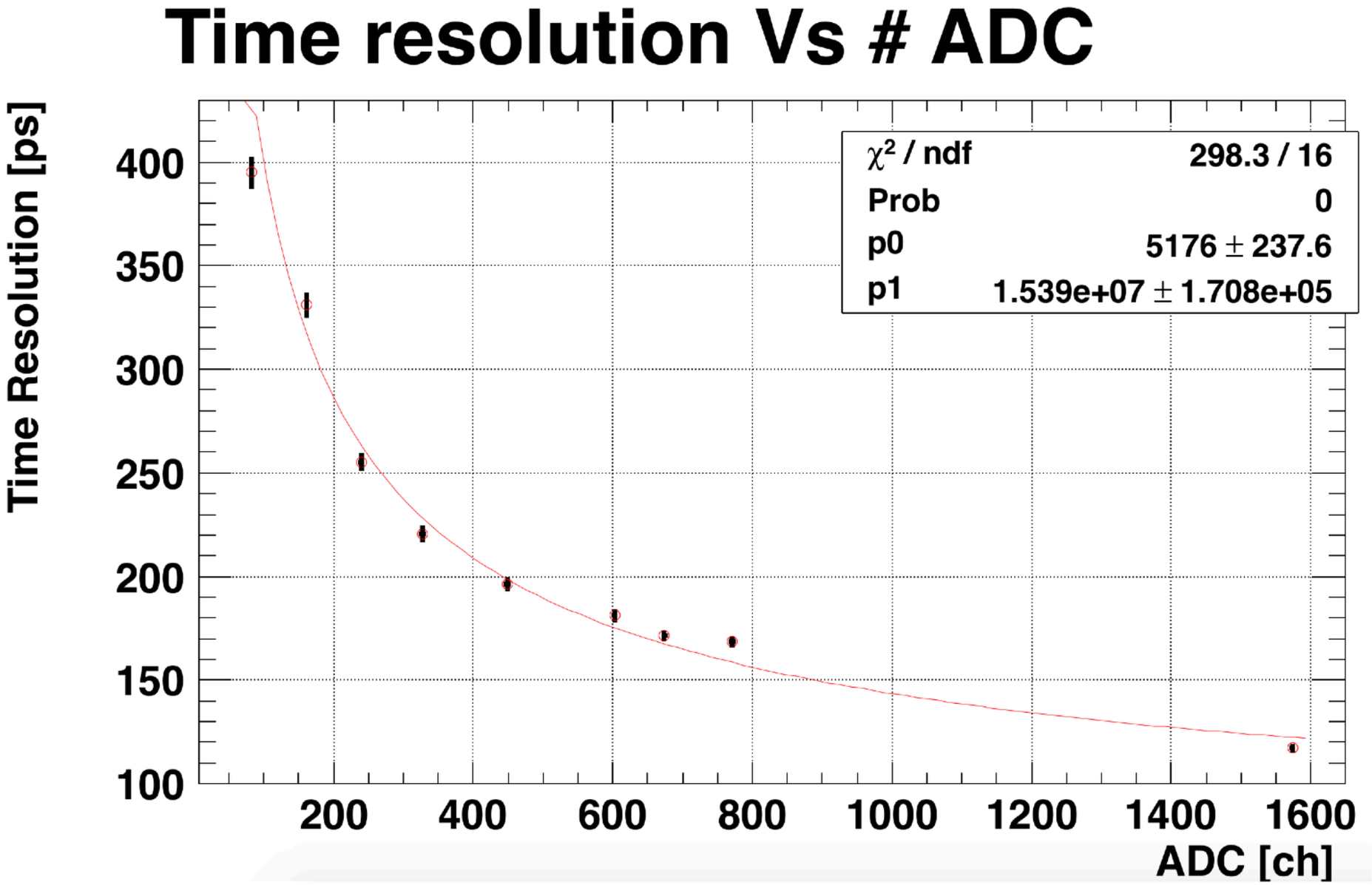
$$\sigma_{\text{Trigger counter}} = \sigma_{\text{tof}}/\sqrt{2}$$

Number of MPPCs

ADC VS # OF MPPCS



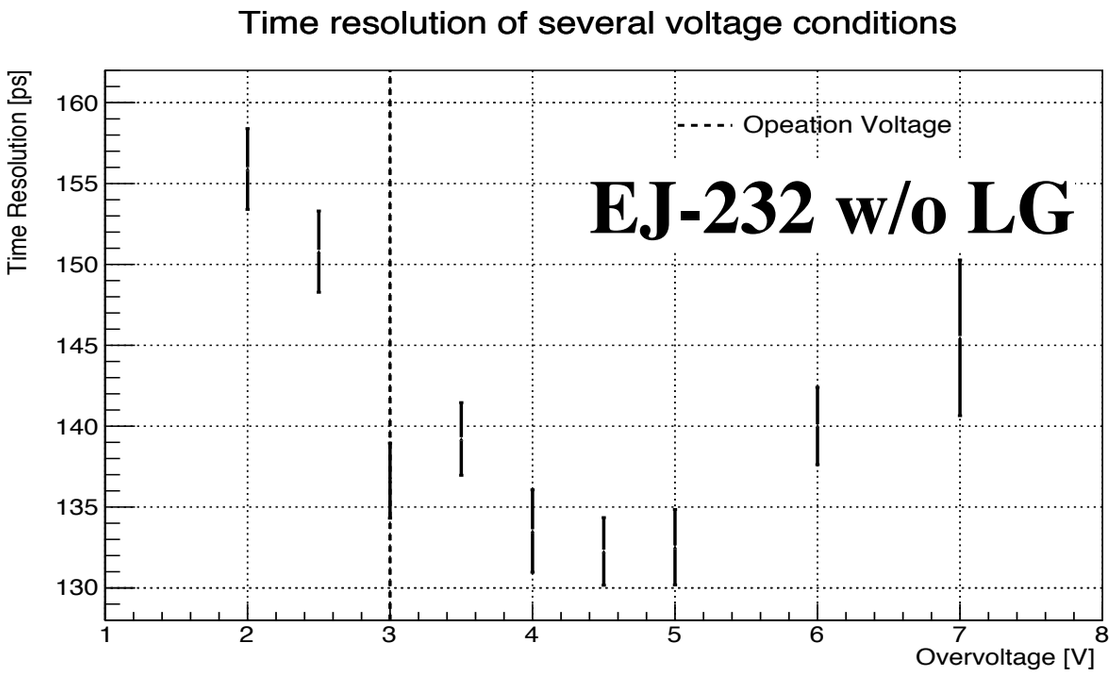
ADC VS # OF MPPCS

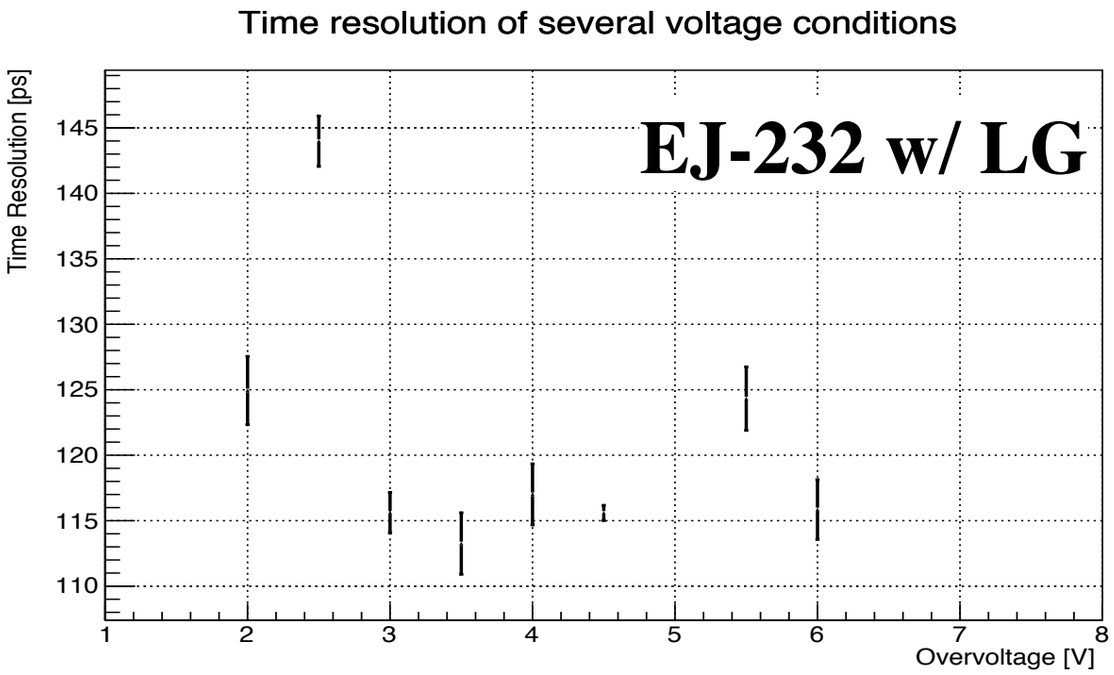


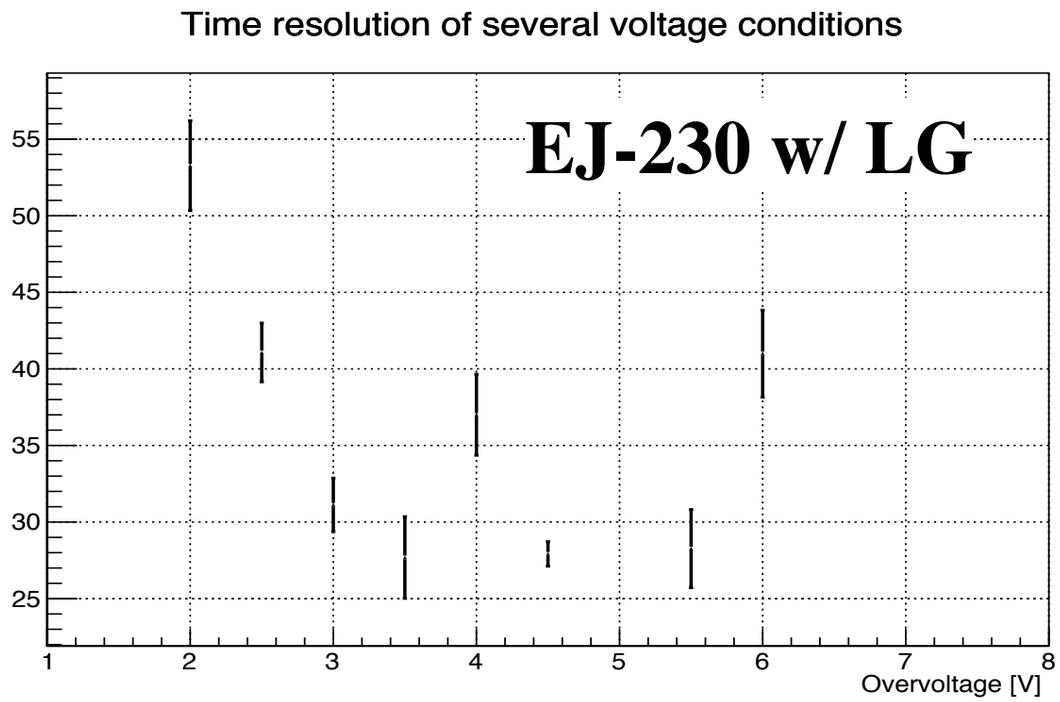
Converge to ~72 ps

BACKUP

BIAS VOLTAGE DEPENDENCE

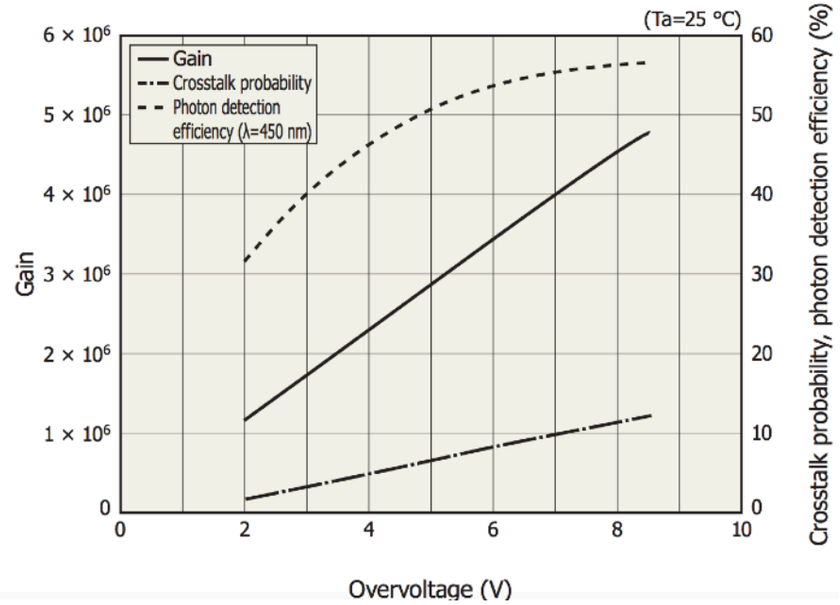




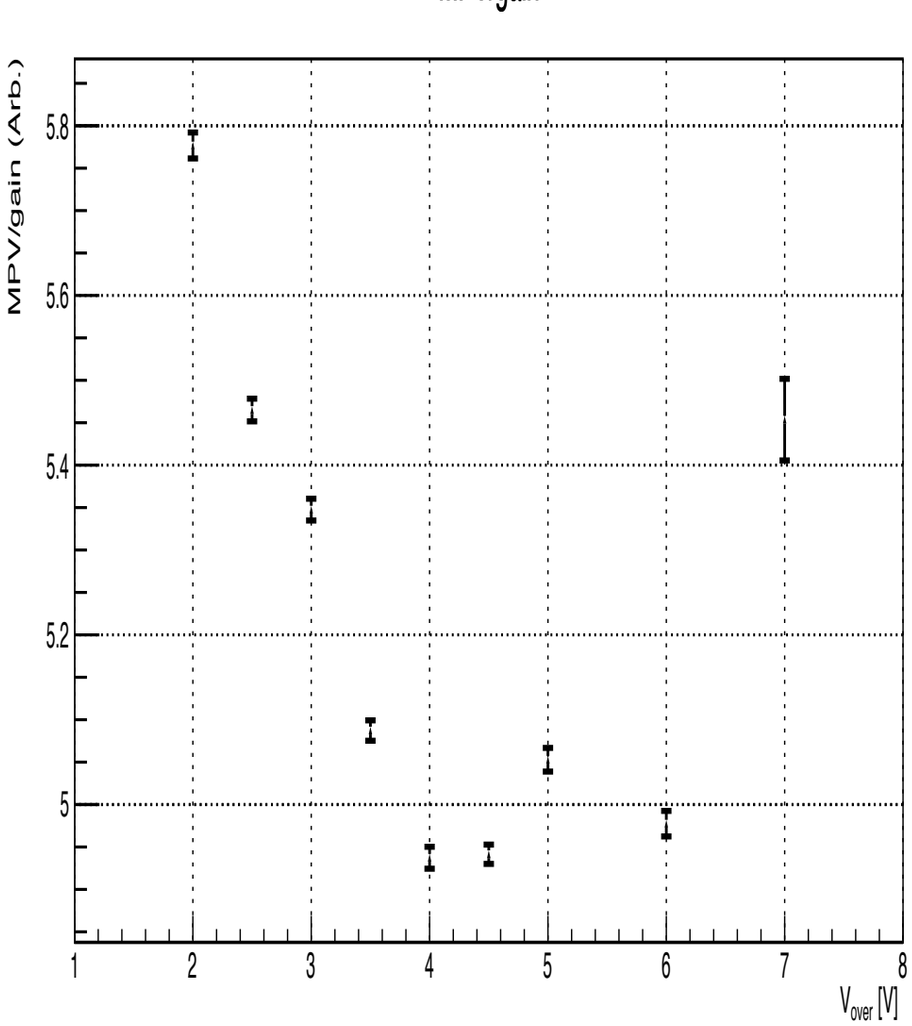


MPV/GAIN

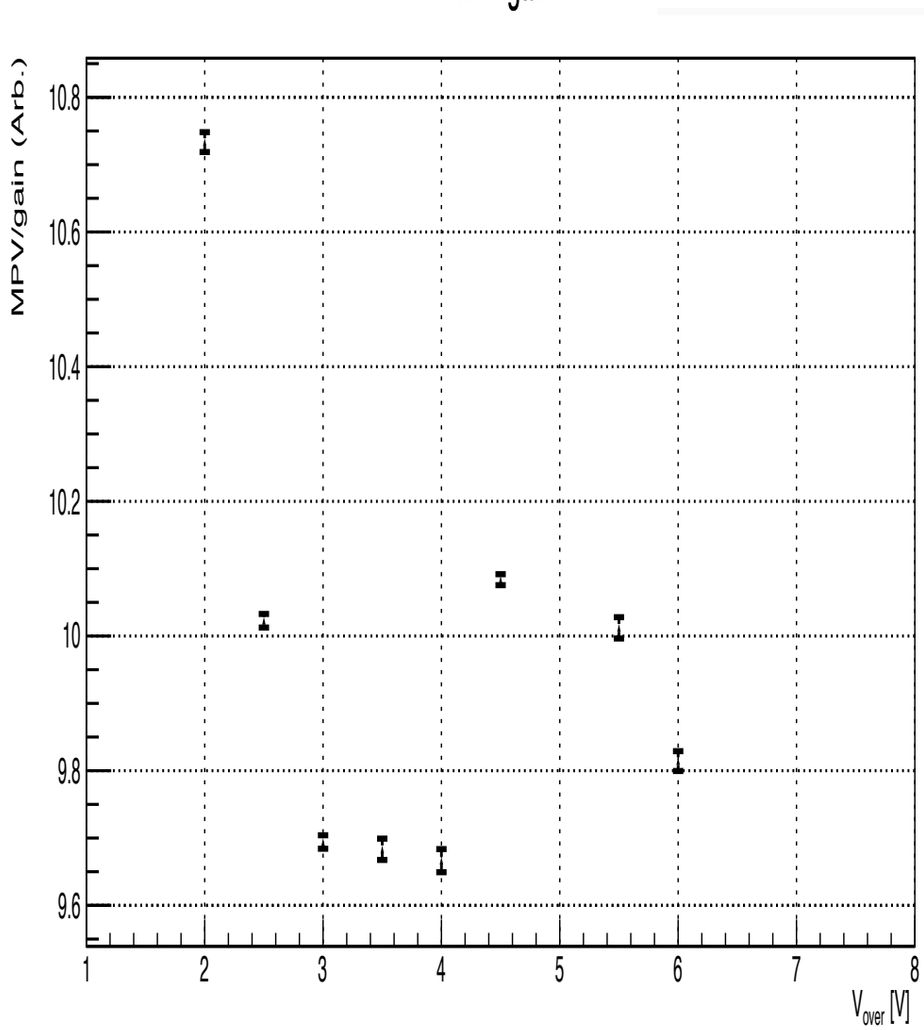
PDE α (MPV/Gain)



EJ-232 w/o LG



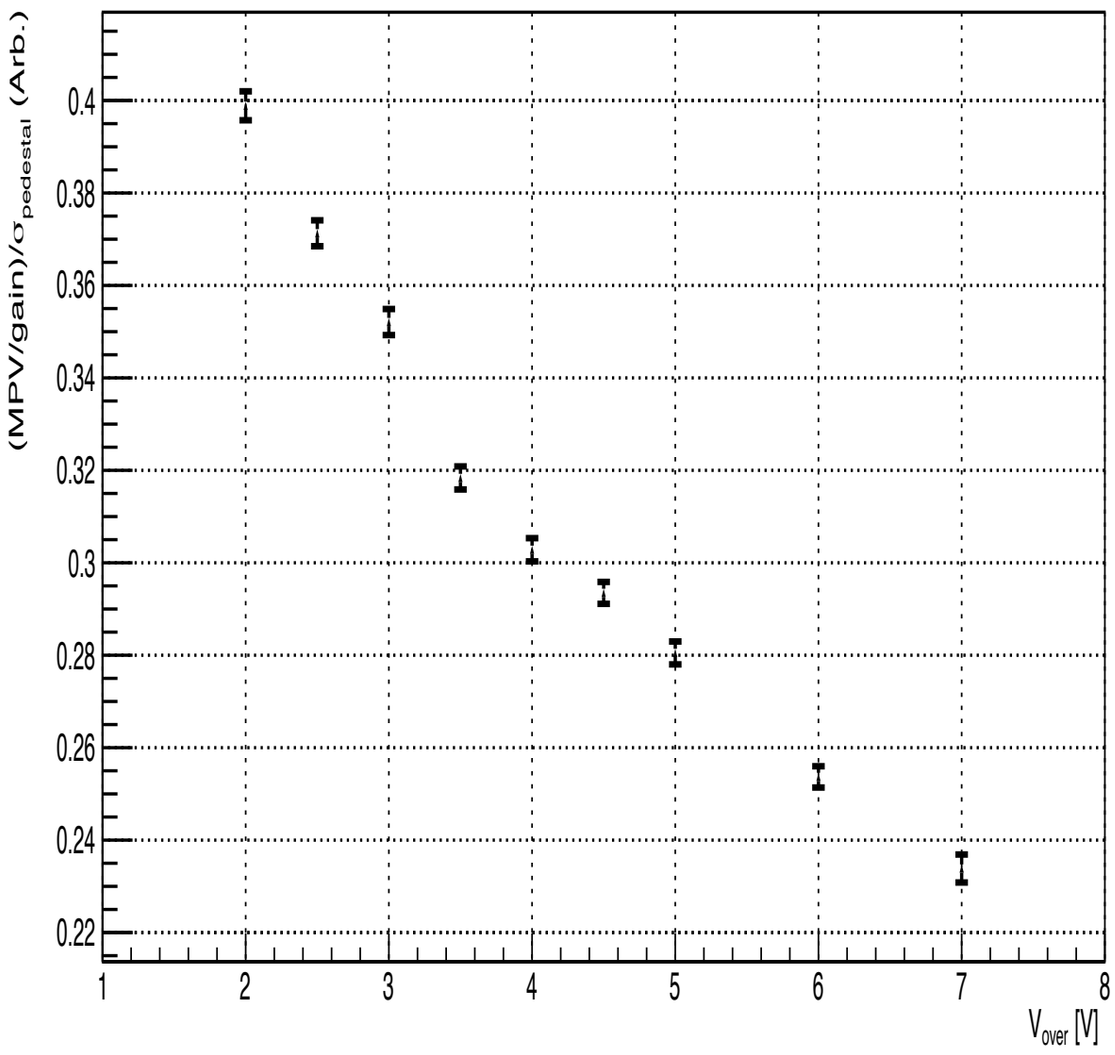
EJ-232 w/ LG



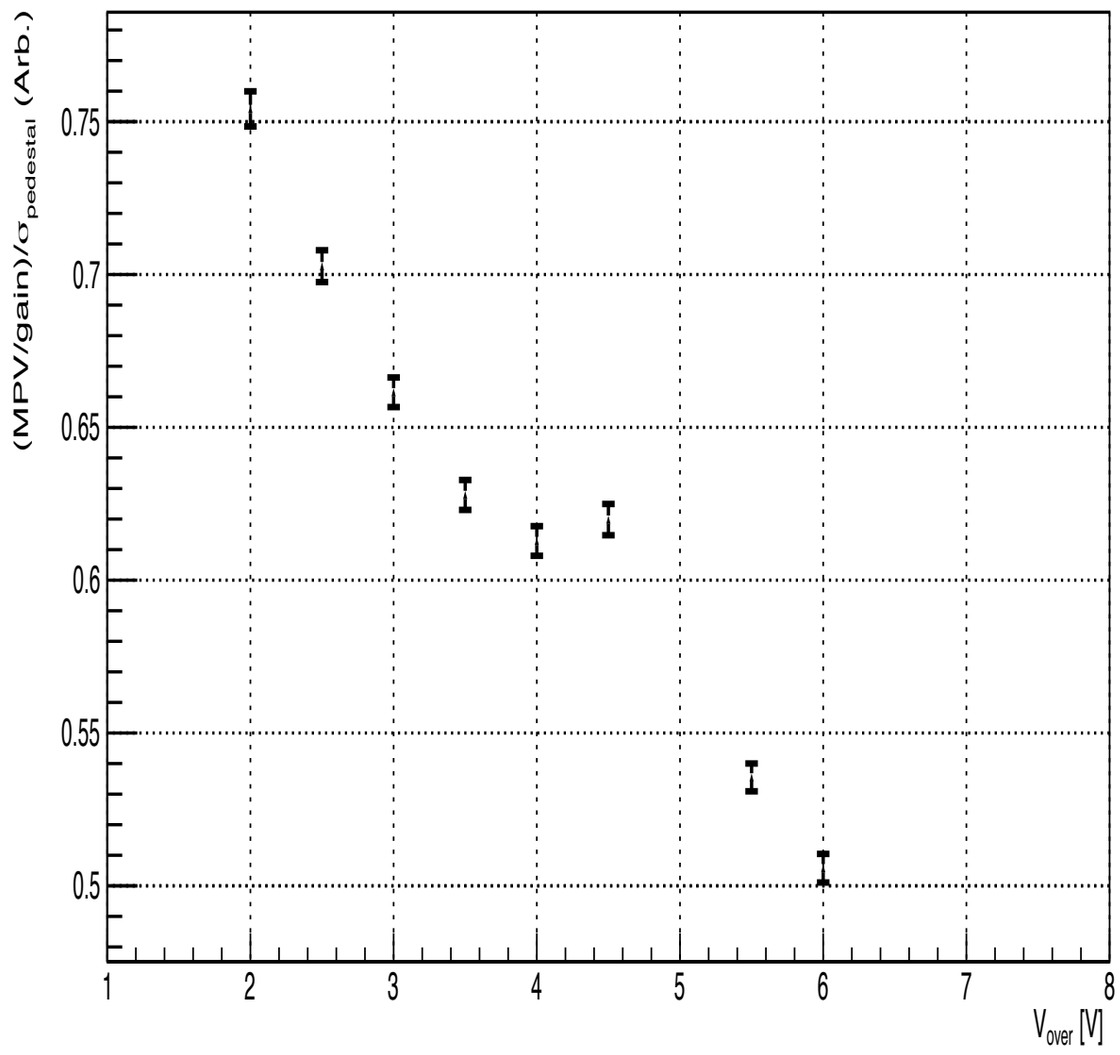
(MPV/GAIN)/$\sigma_{PEDESTAL}$

$PDE/\sigma_{pedestal}$ α $(MPV/Gain)/\sigma_{pedestal}$

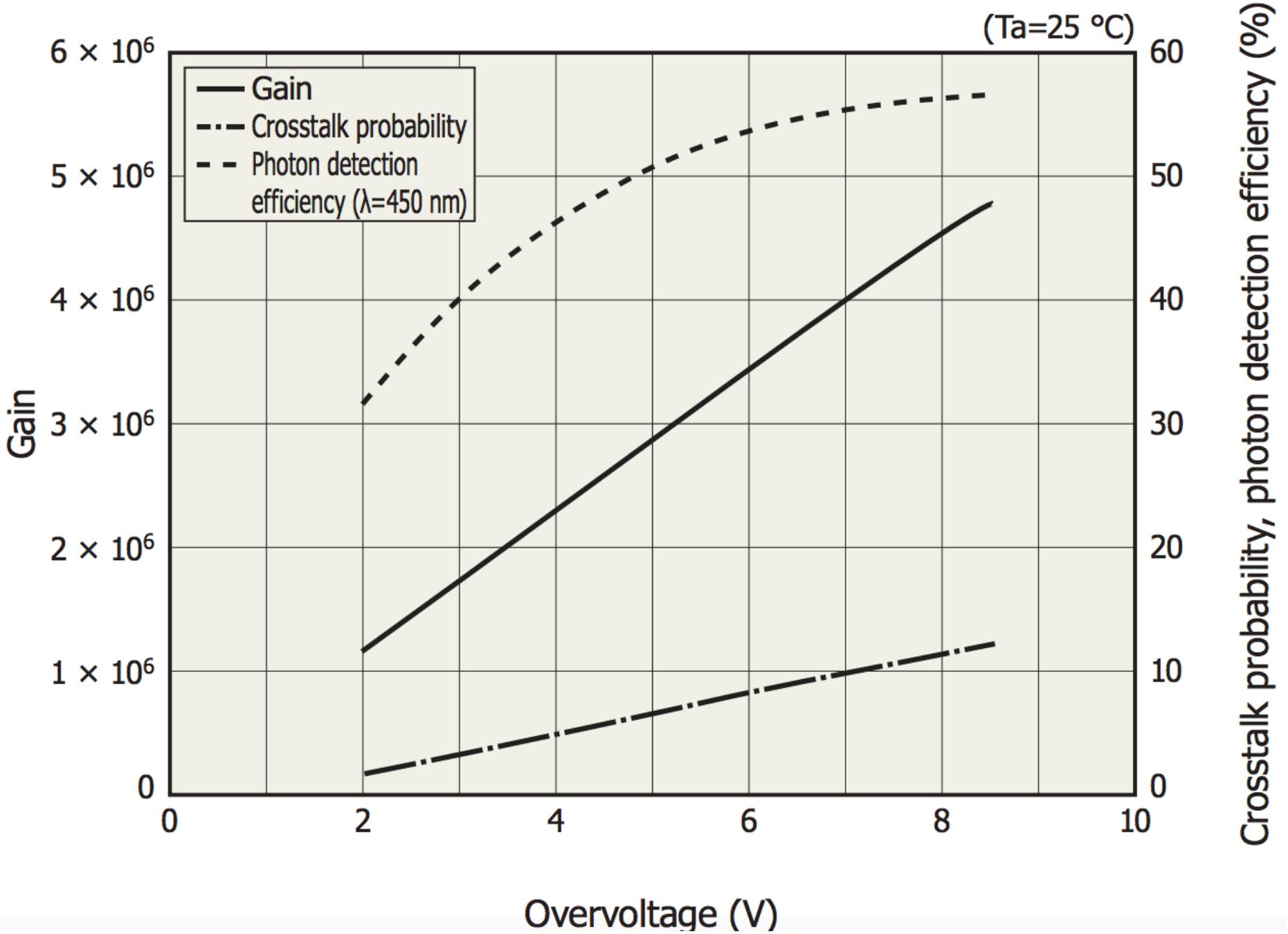
EJ-232 w/o LG



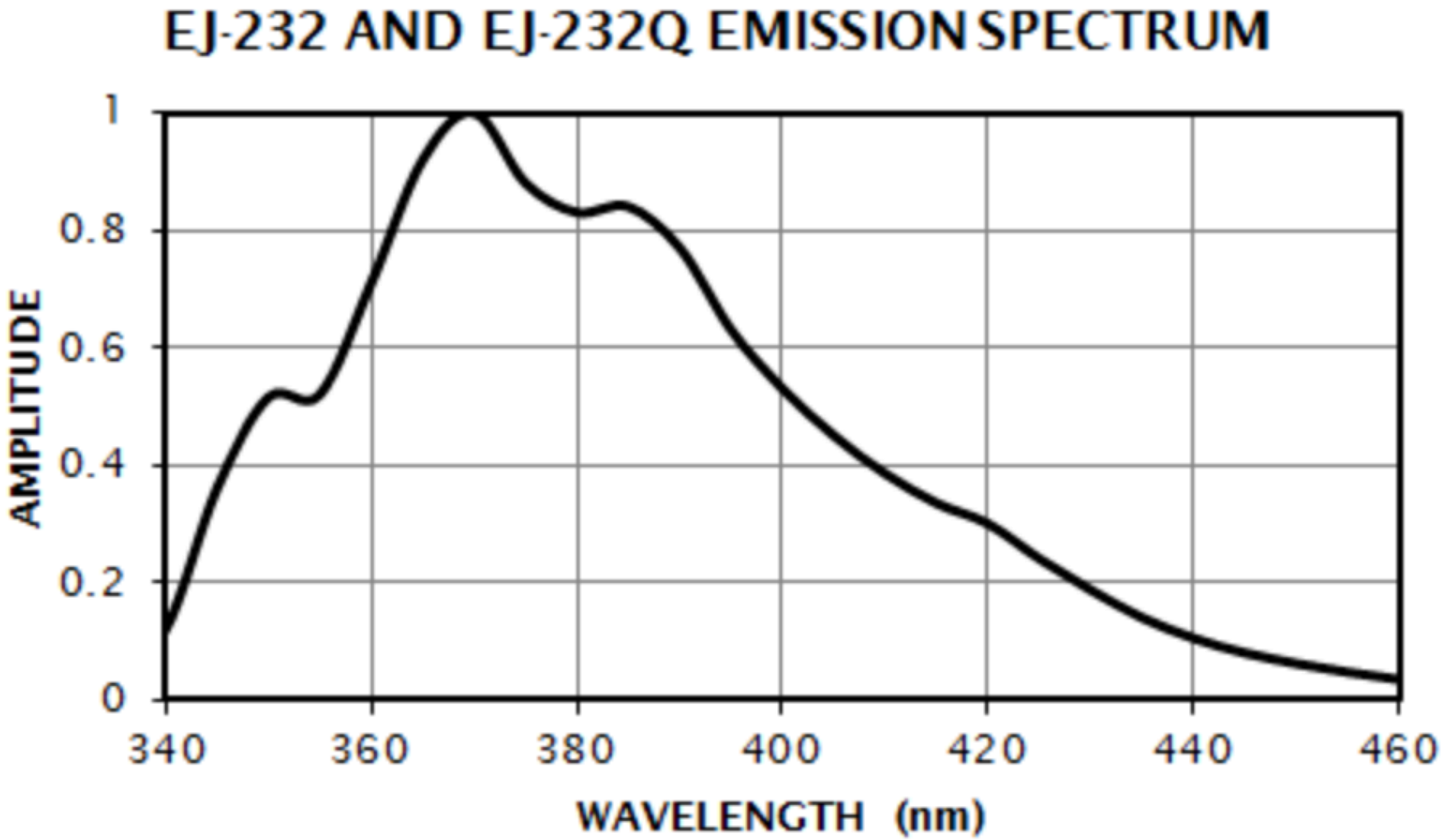
EJ-232 w/ LG



13360-3050PE



EJ-232


EJ-232 AND EJ-232Q EMISSION SPECTRUM
AMPLITUDE
1
0.8
0.6
0.4
0.2
0
340
360
380
400
420
440
460
WAVELENGTH (nm)

SUMMARY

Test results

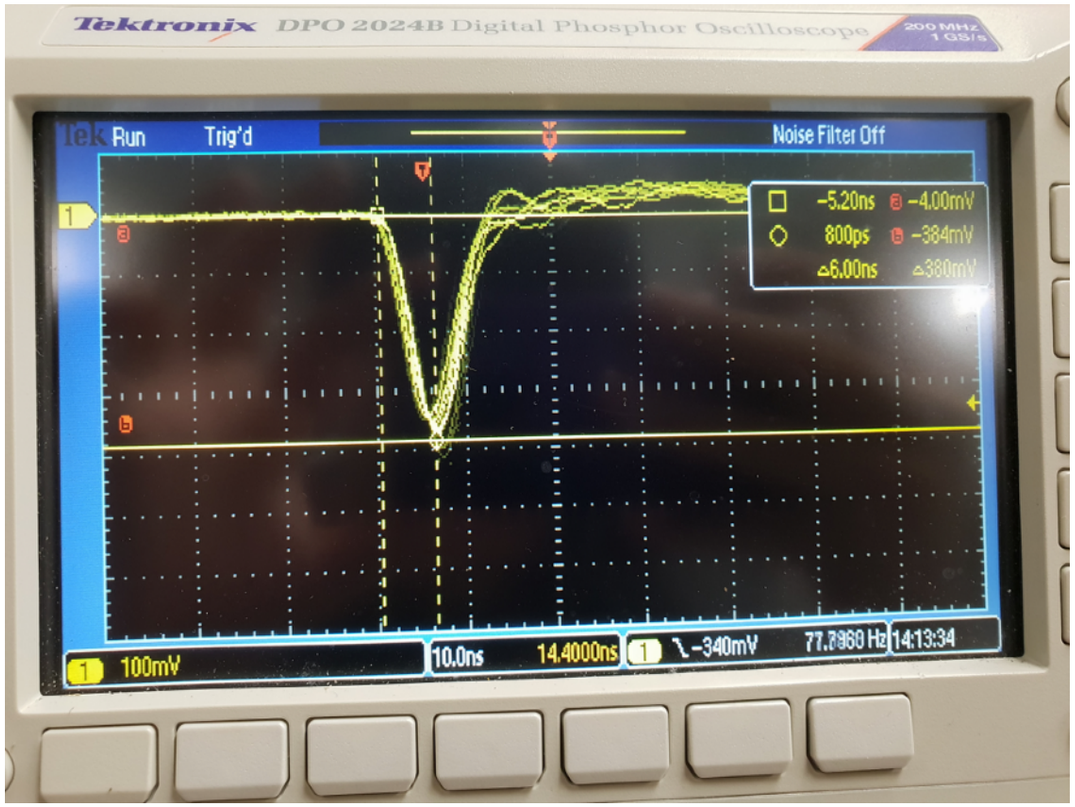
Scinti.	Propagation velocity	w/o light-guides Res. (ps)	MPV(ch)	atten. (cm)	w/ light-guides Res. (ps)	MPV(ch)	atten. (cm)
EJ-200	16.5 cm/ns	174 +/- 1	588	55.4 +/- 0.1			
EJ-230	16.3 cm/ns	156 +/- 1	720	90.1 +/-0.2	125 +/- 1	1380	246.6 +/- 1.5
EJ-232	16.3 cm/ns	134 +/- 1	771	76.7 +/- 0.1	117 +/- 1	1573	174.3 +/- 0.7

Data sheet (1x20x200 cm)

	Atten. length	Rise time	wavelength	S-G	
EJ-200	380 cm	0.9 ns	425 nm	BC-408	210 cm
EJ-230	120 cm	0.5 ns	391 nm	BC-420	140 cm
EJ-232	-	0.35 ns	370 nm	BC-422	-

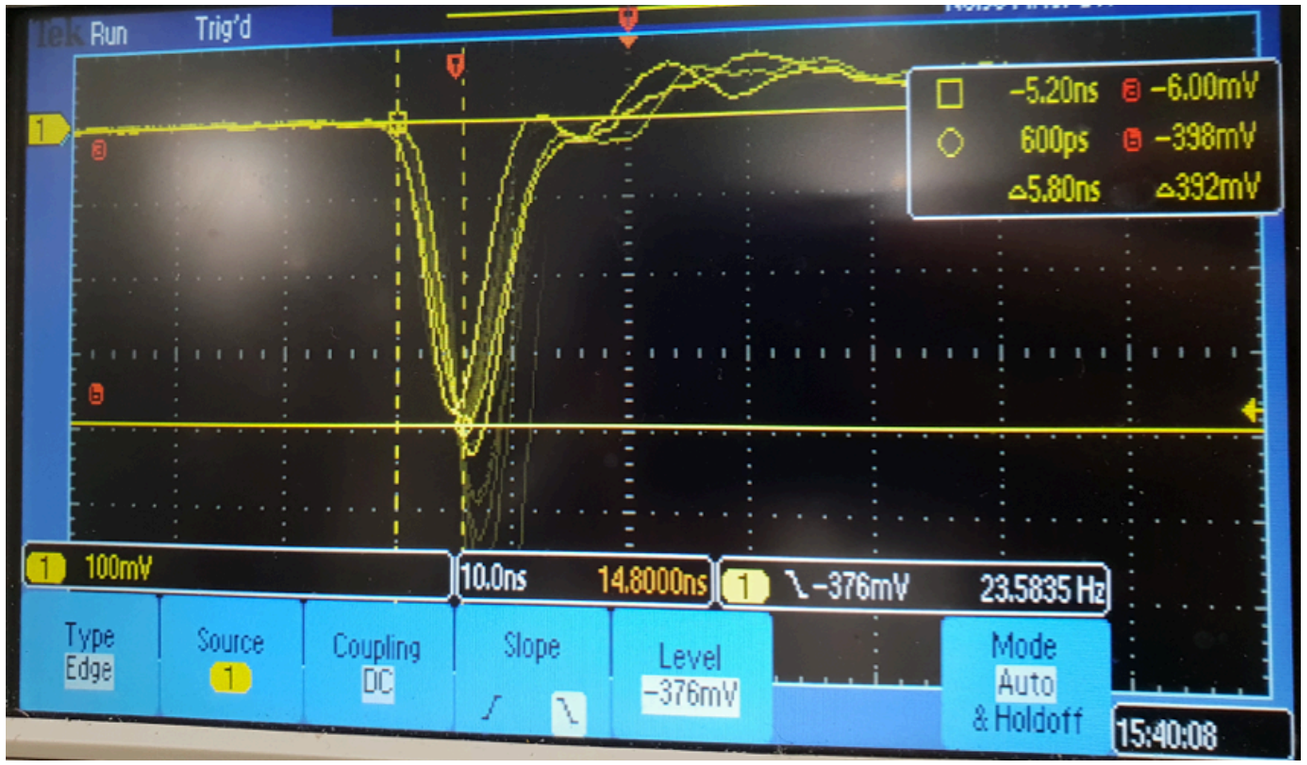
SIGNAL PICTURE

EJ-232 w/ light guide



rise time ~ 6 ns

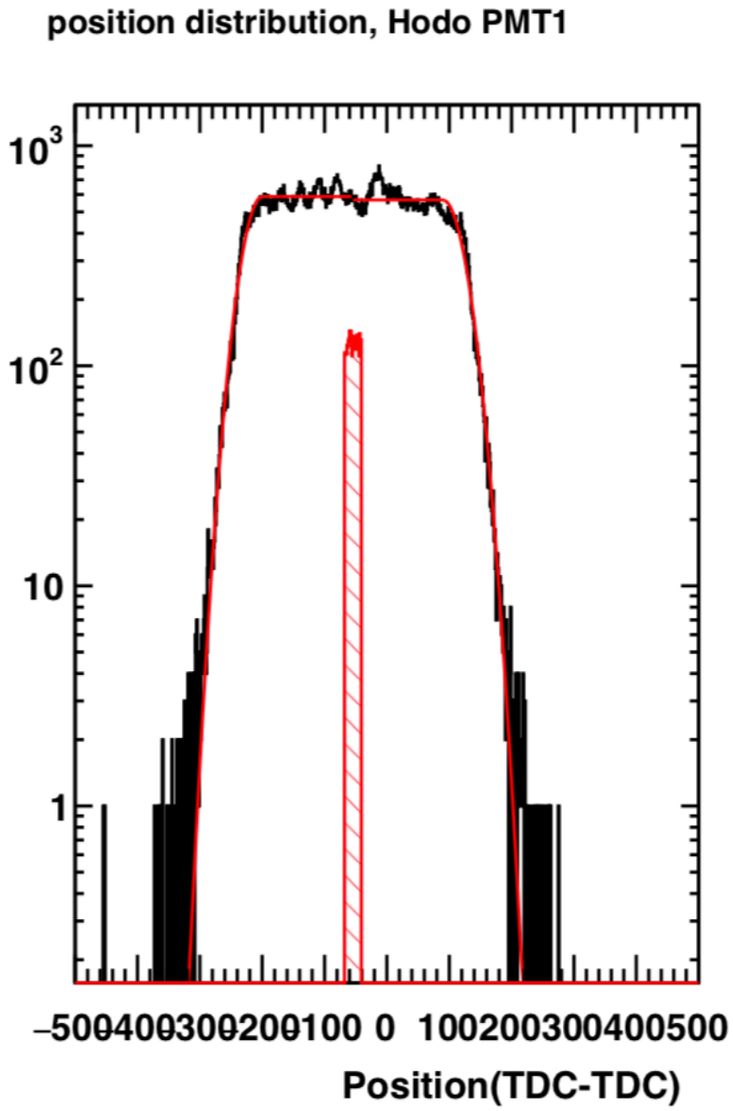
EJ-230 w/ light guide

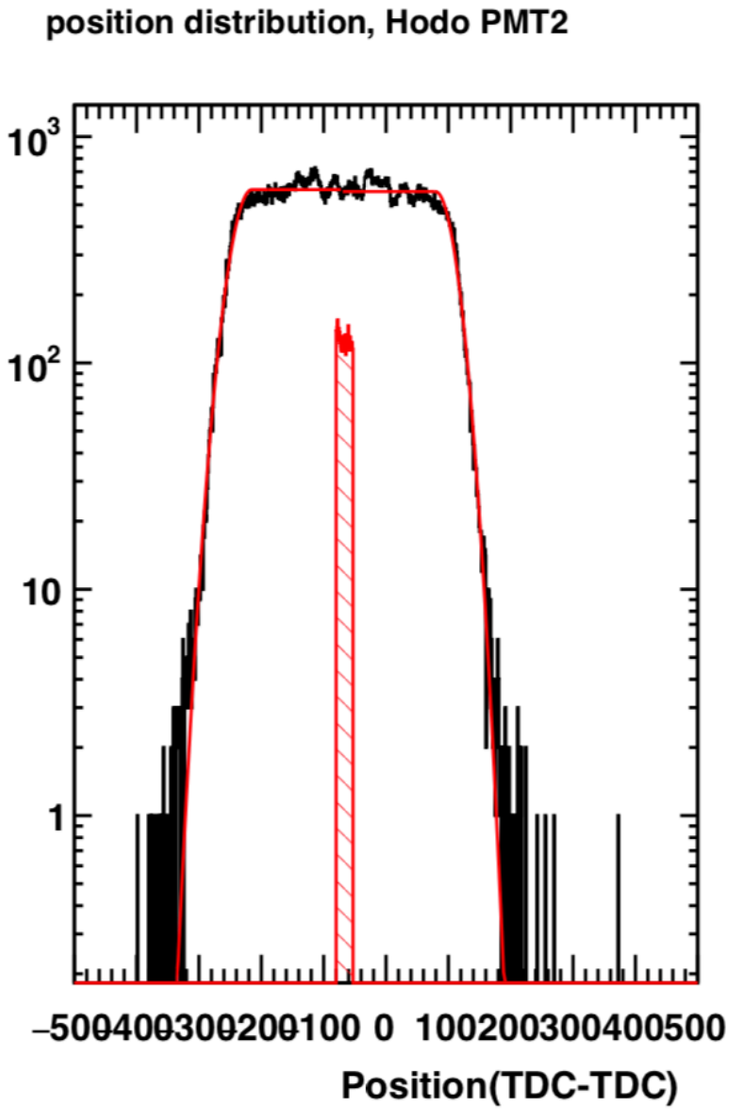


rise time ~ 6 ns

EVENT SELECTION

Selected the events corresponding to 8 cm region





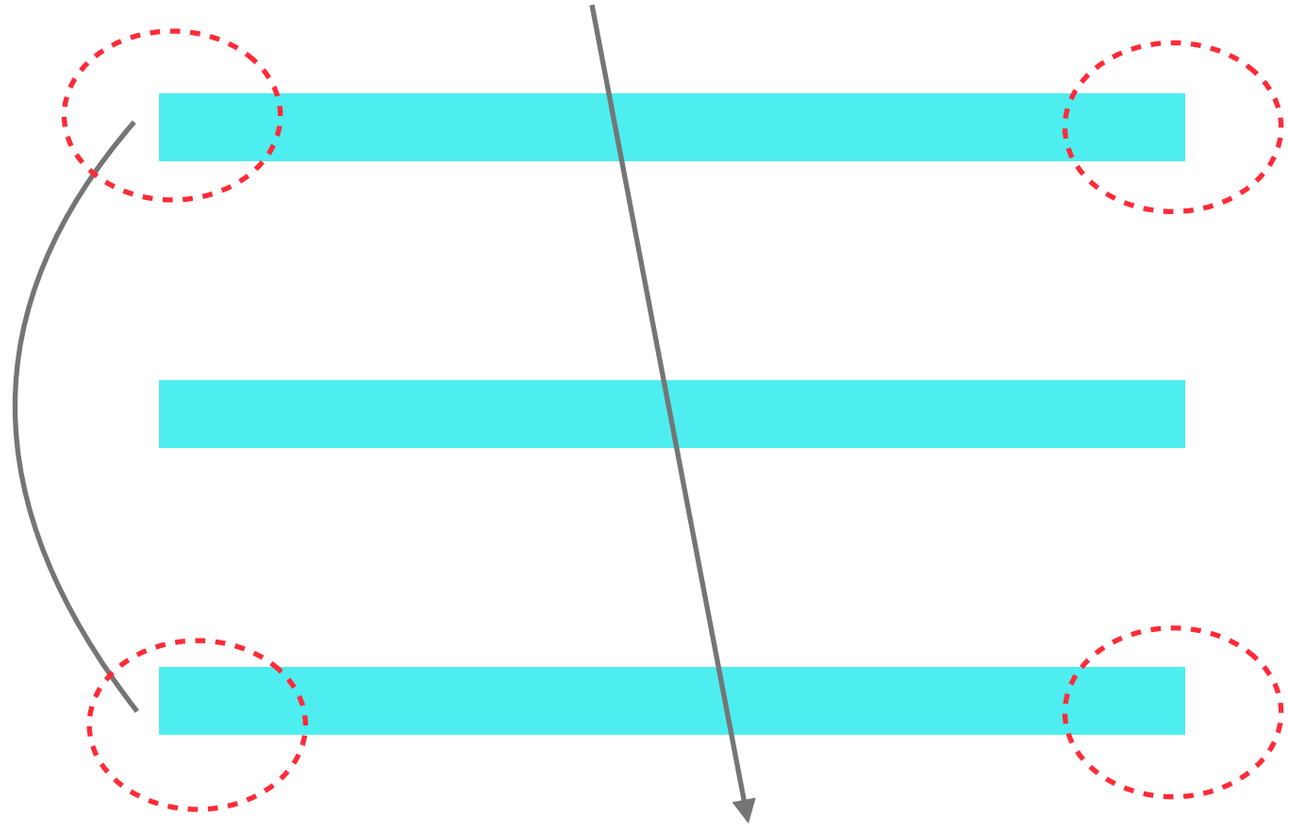
Fitting functions

$$p_0 exp[-\frac{(min(z,p_1)-p_1)^2}{2p_2^2}]$$

$$p_0 exp[-\frac{(max(z,p_1)-p_1)^2}{2p_2^2}]$$

TIMEWALK CORRECTION

Steps



1. Get tof

2. Timewalk correlation of tof with the four ADCs.

3. Repeat the same way for all three tofs.

TIMEWALK CORRECTION

Timewalk correction

$$t' = t + \frac{a}{\sqrt{Q - Q_0}}$$

Red line : TOF distribution after time walk correction