

haul meeting

Hodoscope report

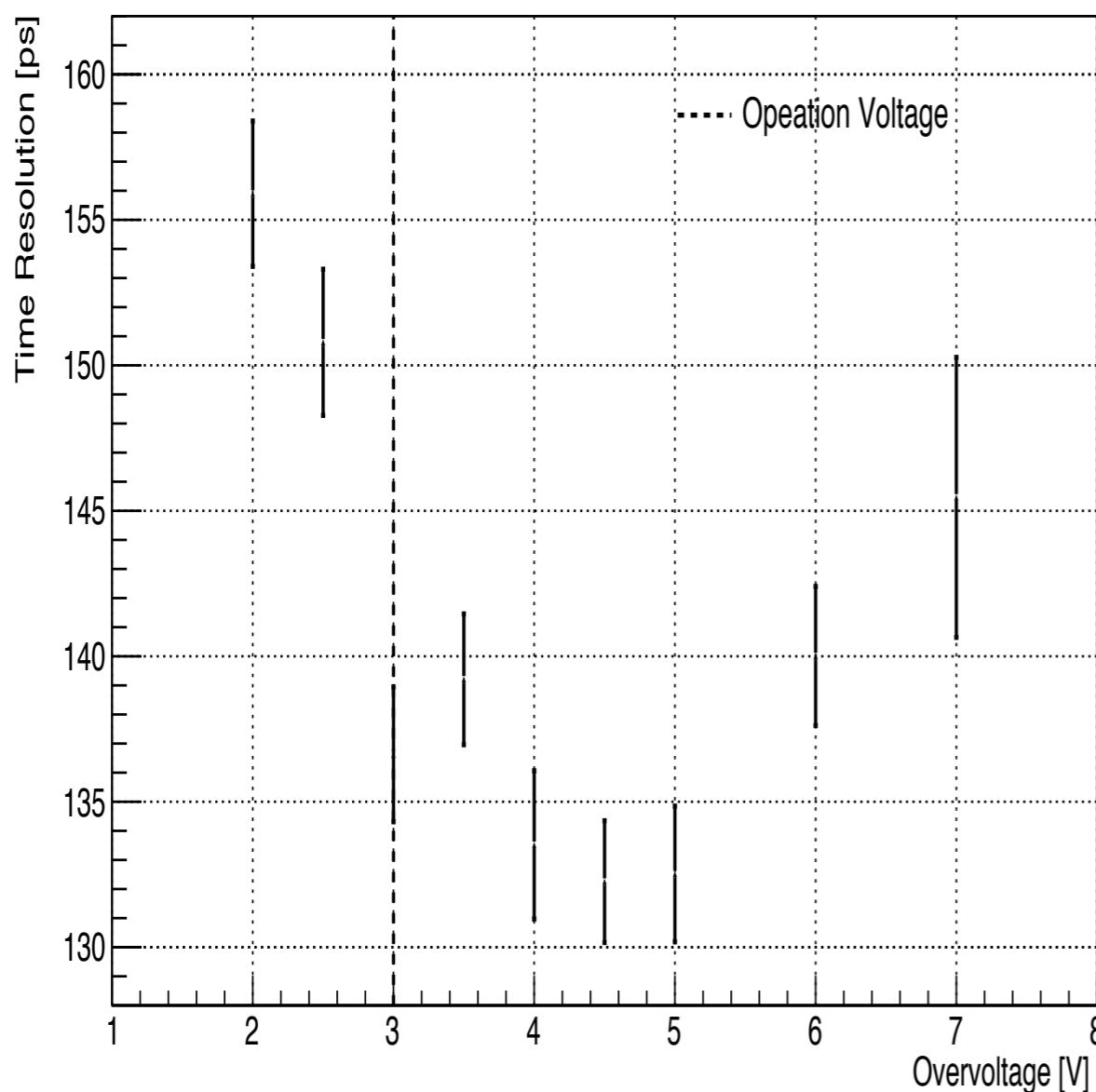
Korea Univ.
Wooseung Jung

EJ-232 w/ or w/o LG Bias voltage dependence

BIAS VOLTAGE DEPENDENCE

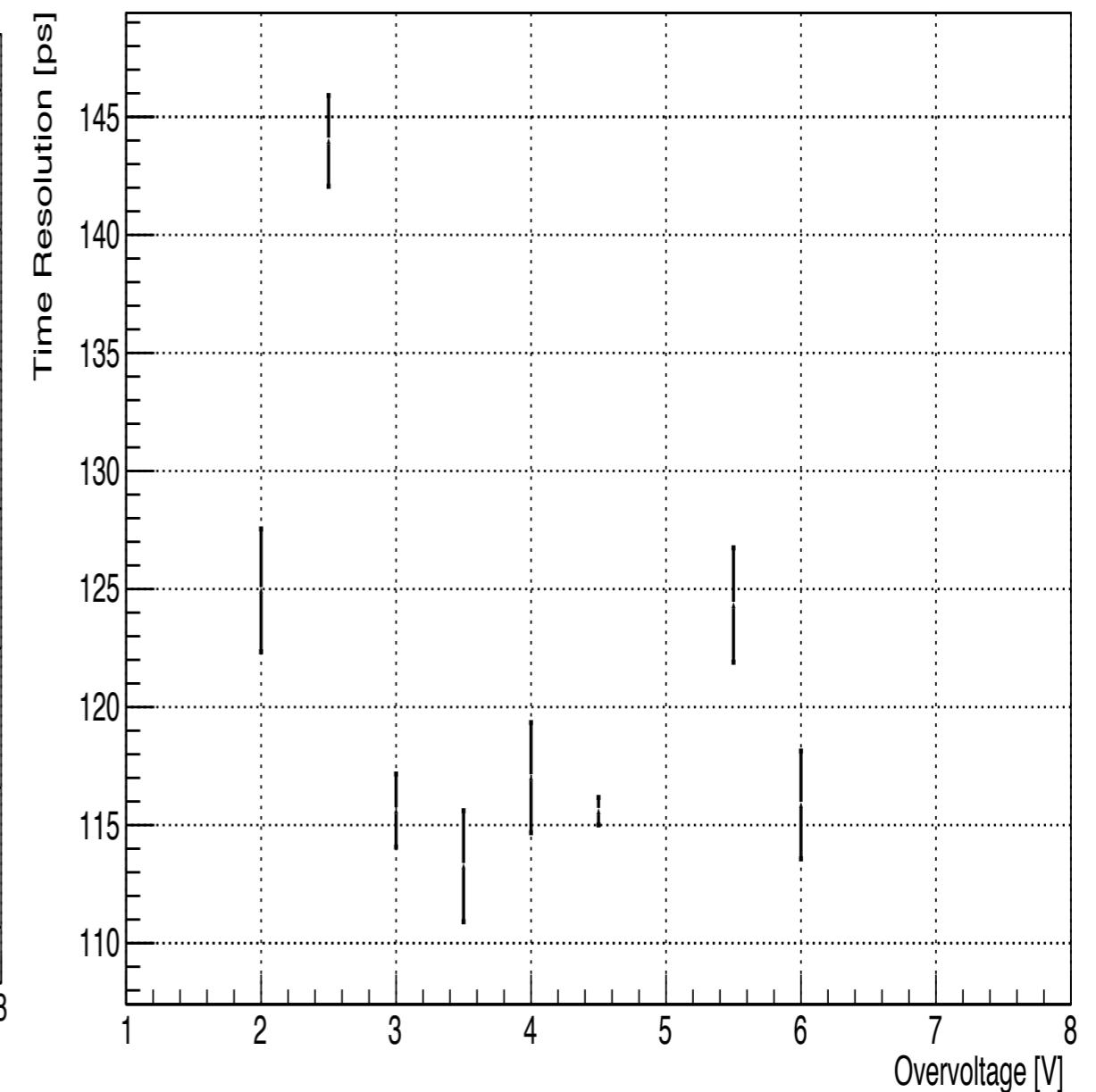
EJ-232 w/o LG

Time resolution of several voltage conditions



EJ-232 w/ LG

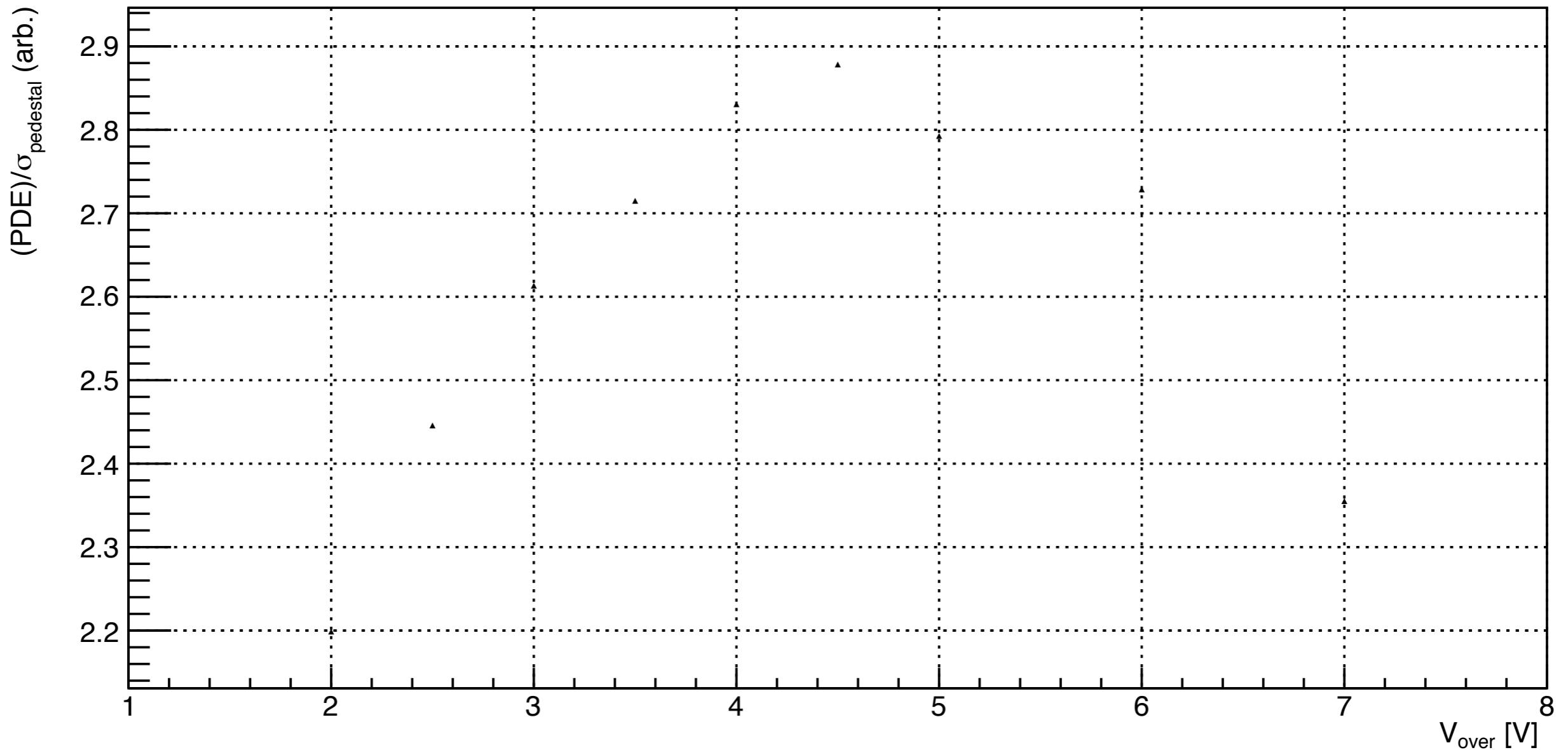
Time resolution of several voltage conditions



BIAS VOLTAGE DEPENDENCE

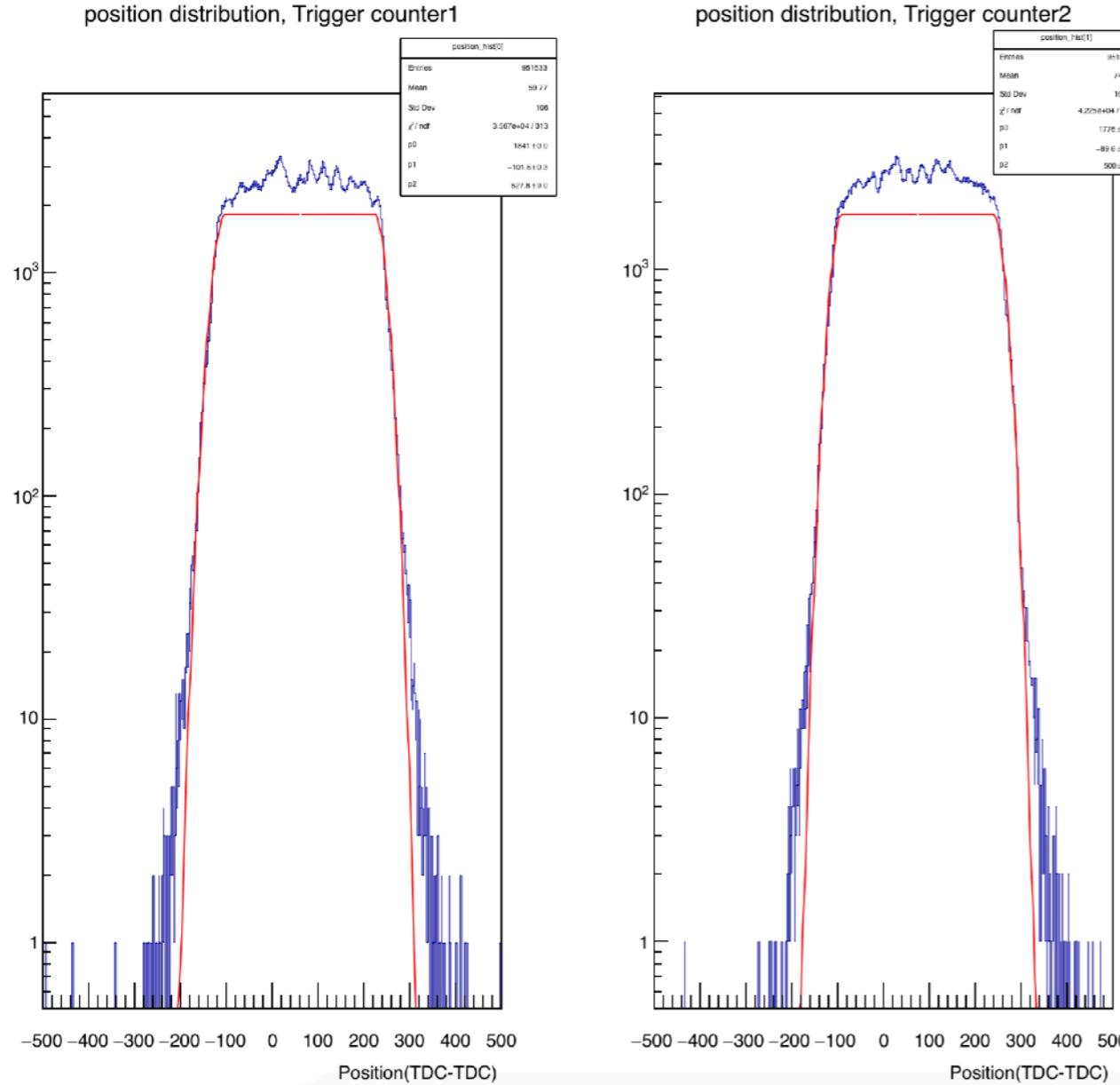
EJ-232 w/o LG

$(PDE)/\sigma_{\text{pedestal}}$



position dependence

POSITION DEPENDENCE

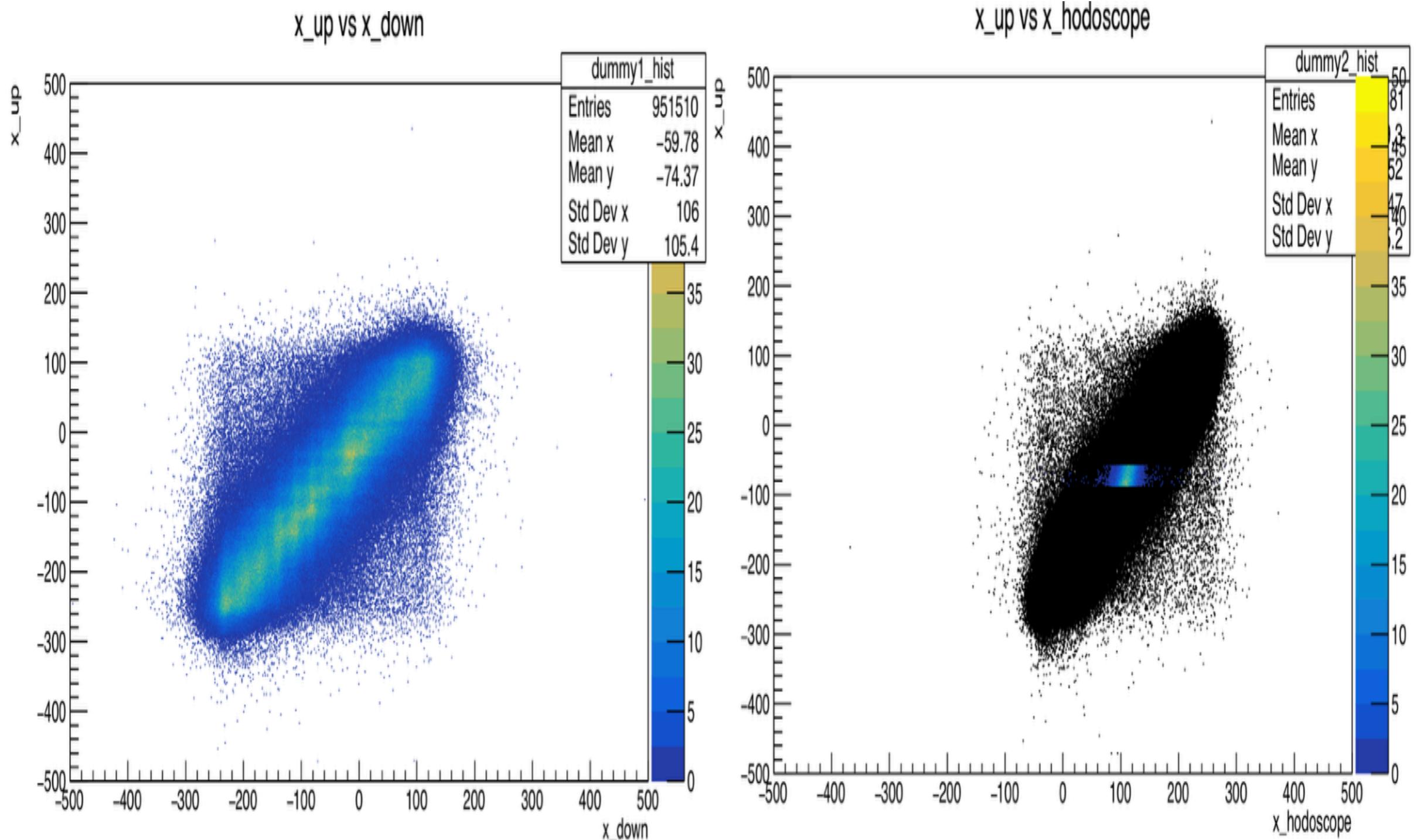


Fitting functions

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

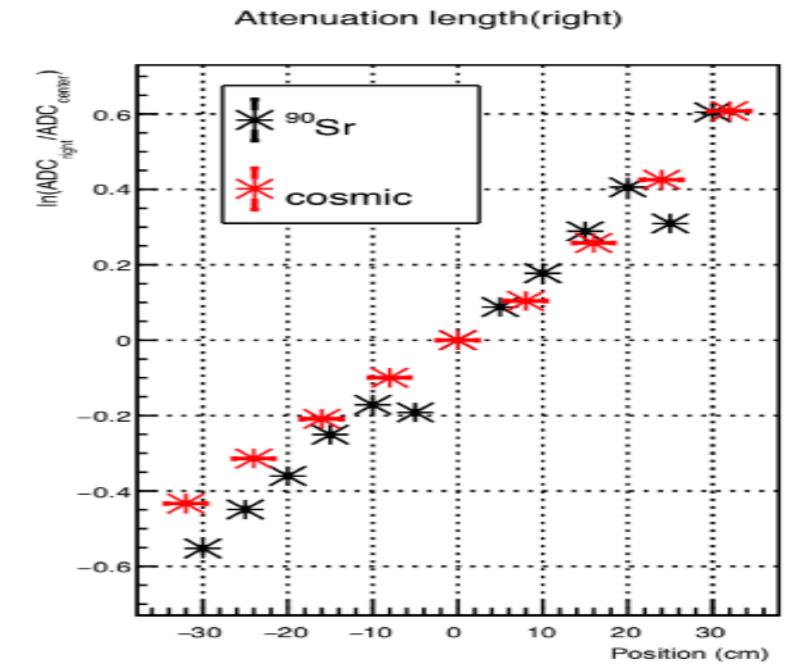
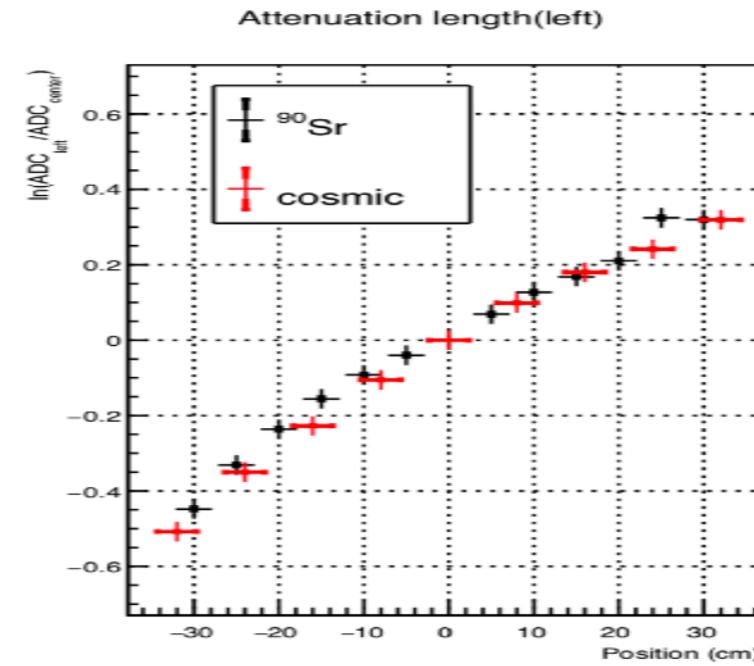
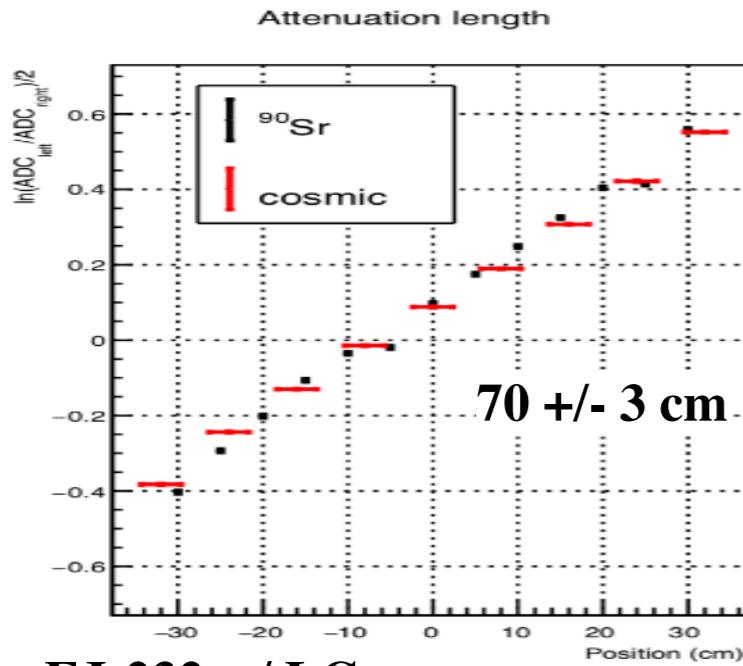
$$p_0 \exp\left[-\frac{(max(z, p_1) - p_1)^2}{2p_2^2}\right]$$

POSITION DEPENDENCE

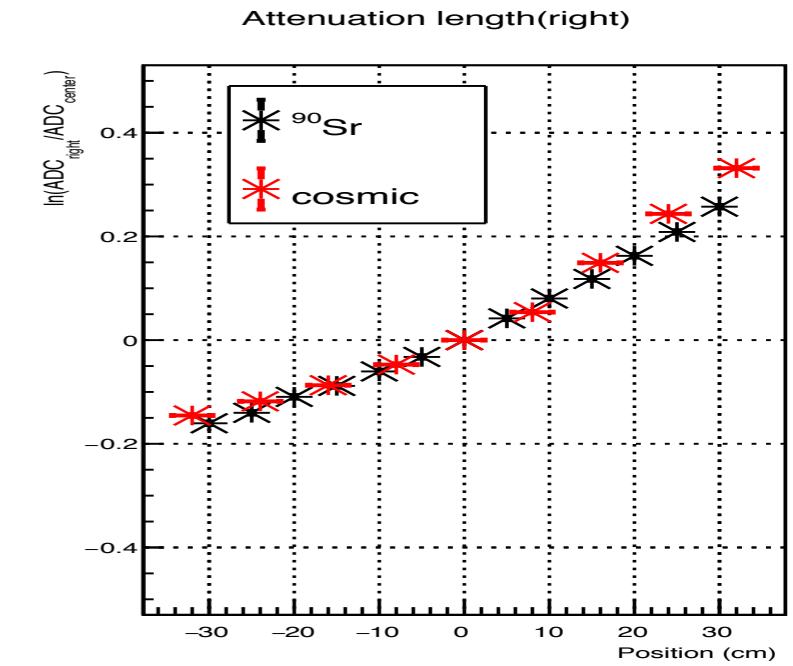
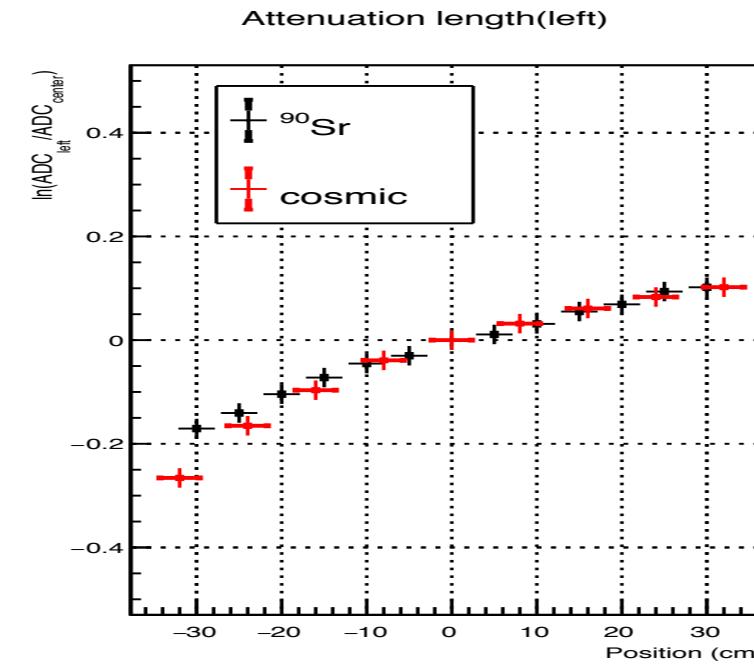
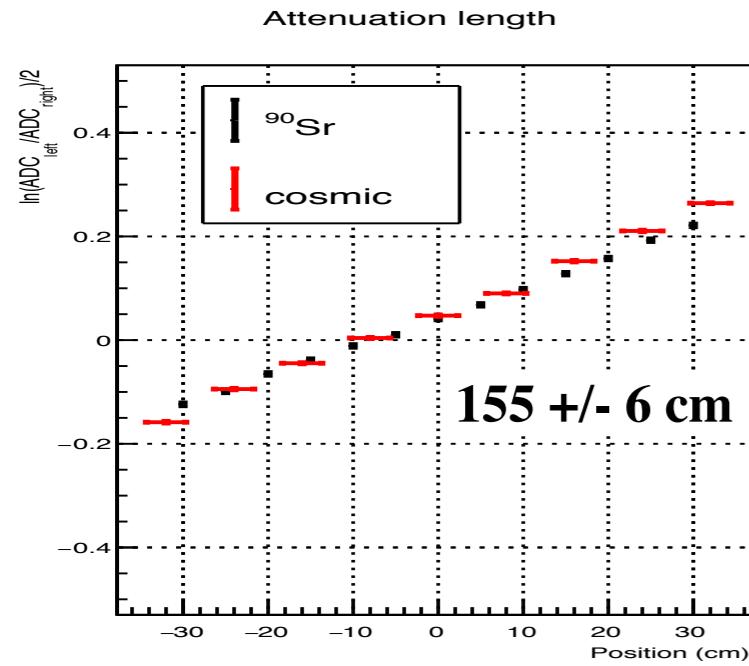


POSITION DEPENDENCE

EJ-232 w/o LG

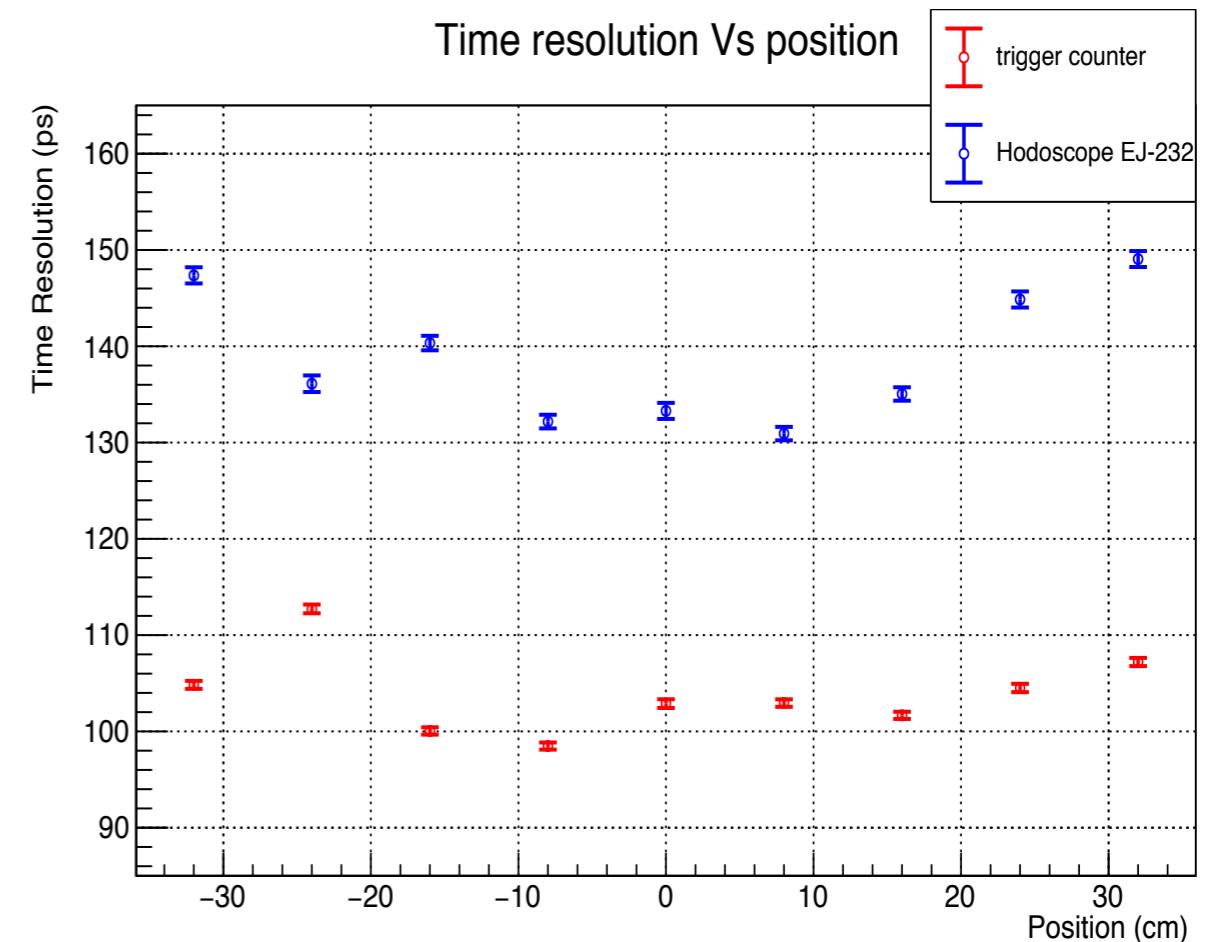
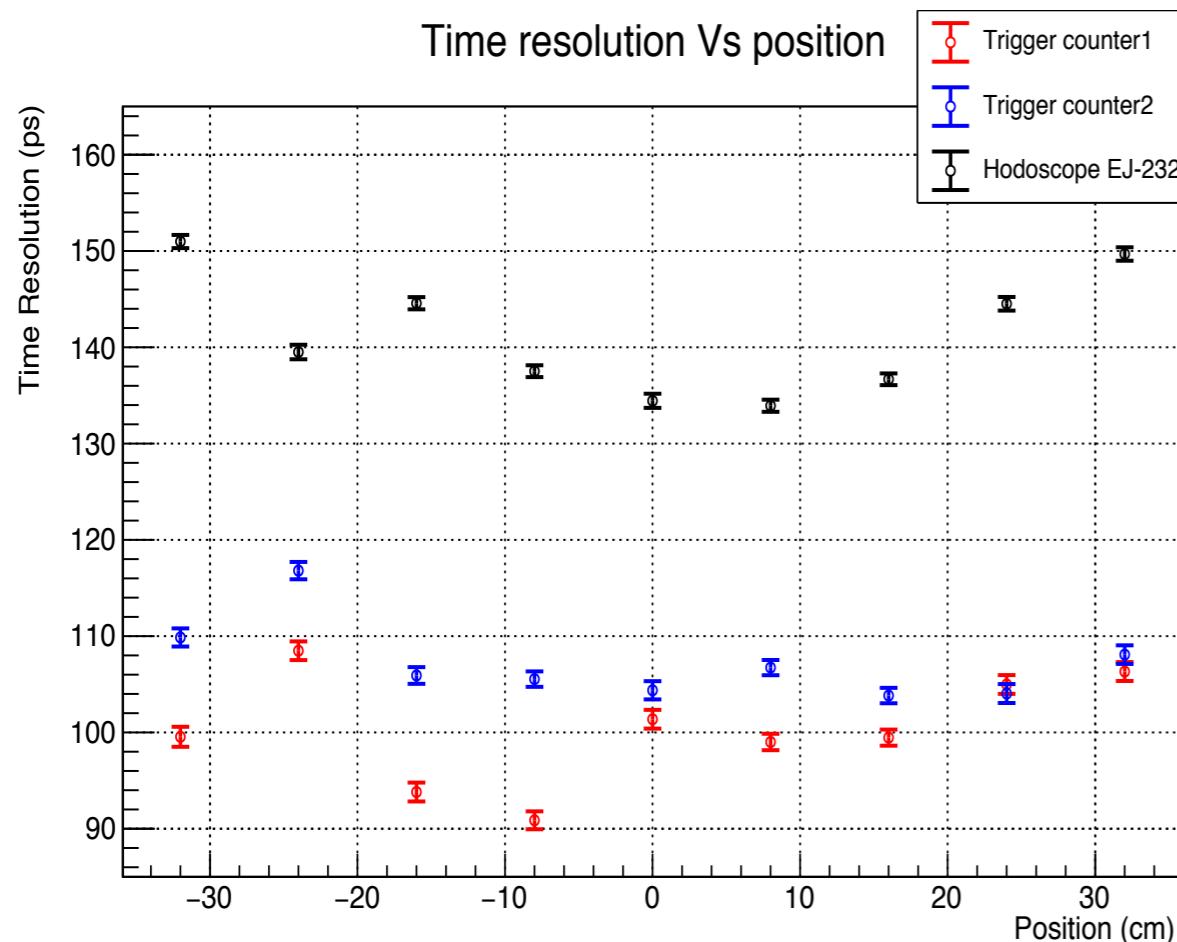


EJ-232 w/ LG



POSITION DEPENDENCE

The time resolution change by location is within 15%.

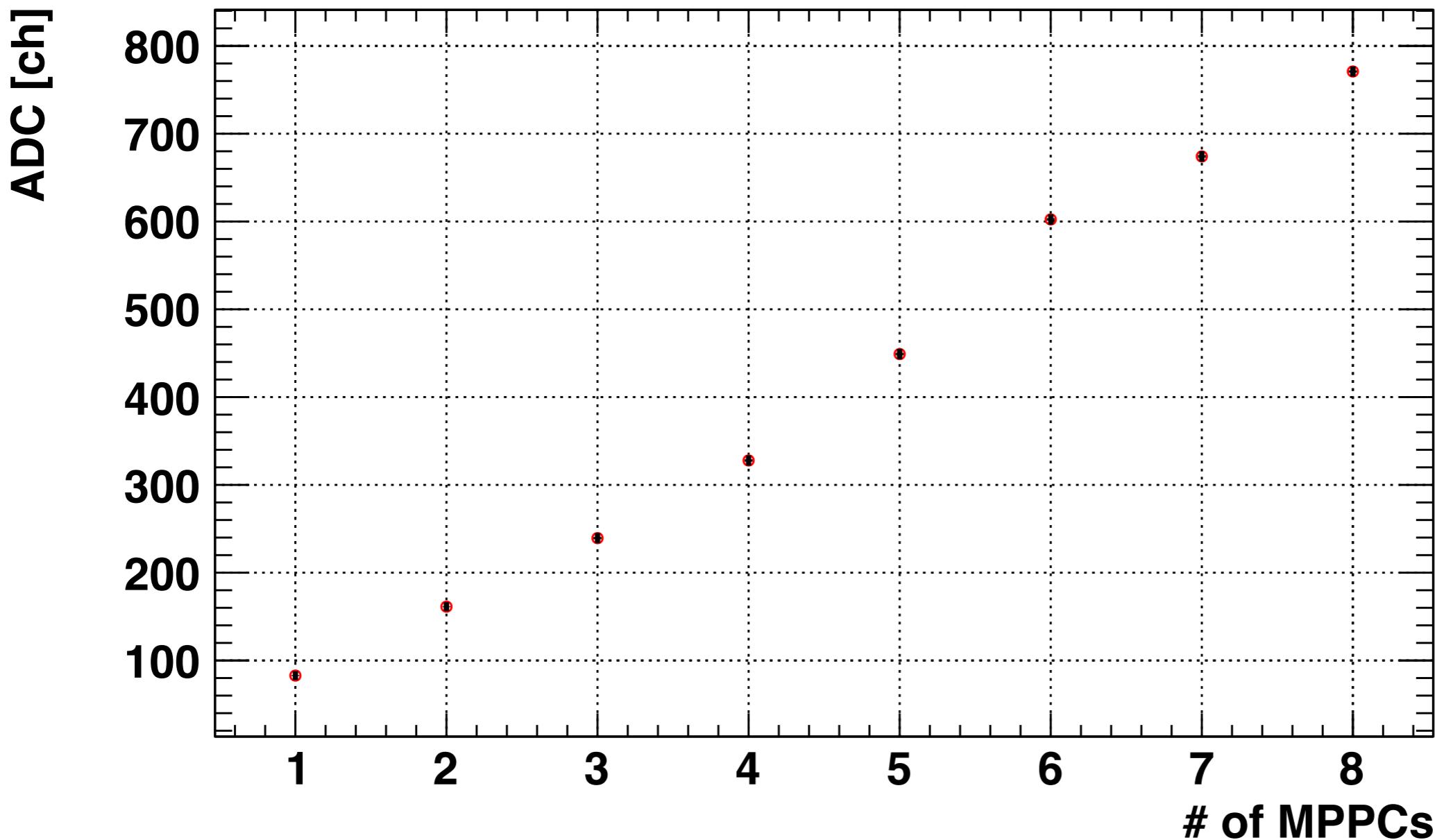


$$\sigma_{\text{Trigger counter}} = \sigma_{\text{tof}}/\sqrt{2}$$

Number of MPPCs

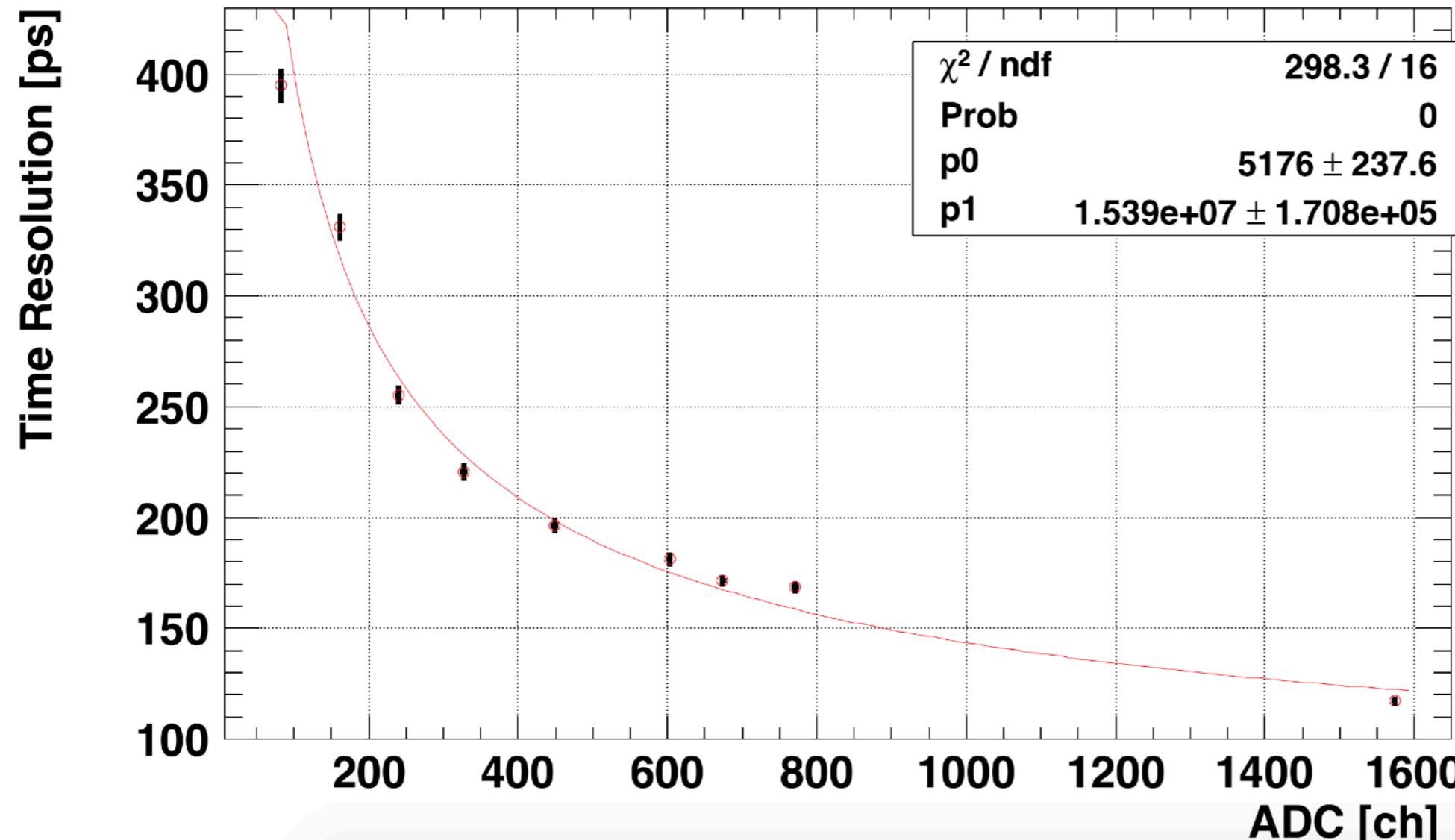
ADC VS # OF MPPCS

ADC Vs # of MPPCs



ADC VS # OF MPPCS

Time resolution Vs # ADC

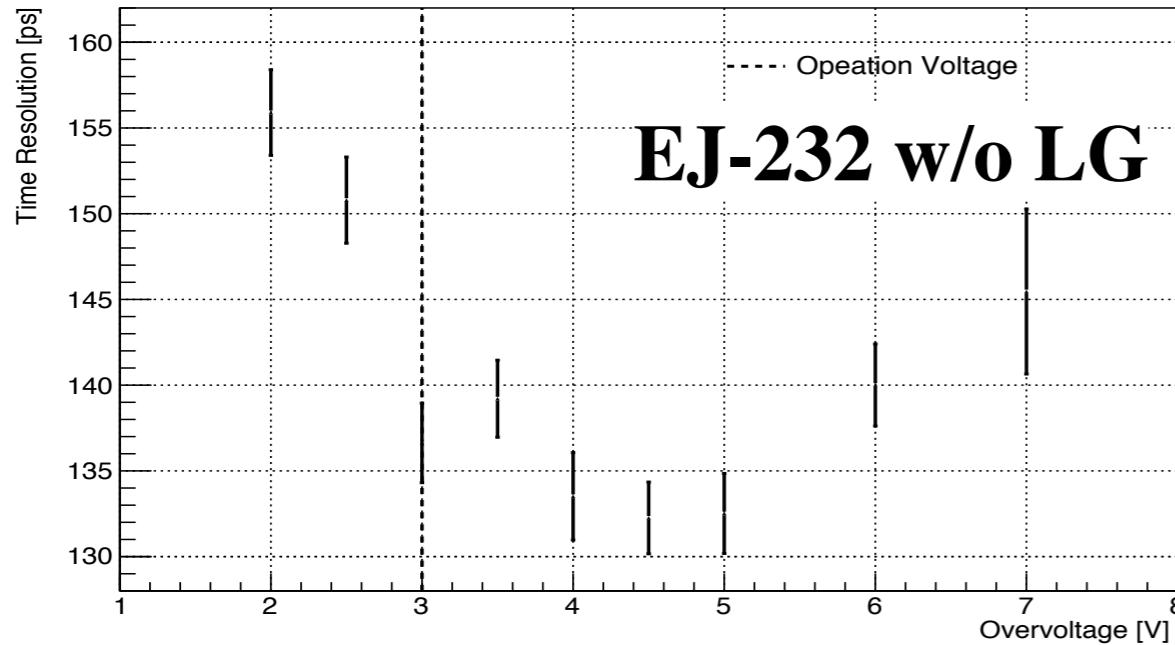


Converge to ~ 72 ps

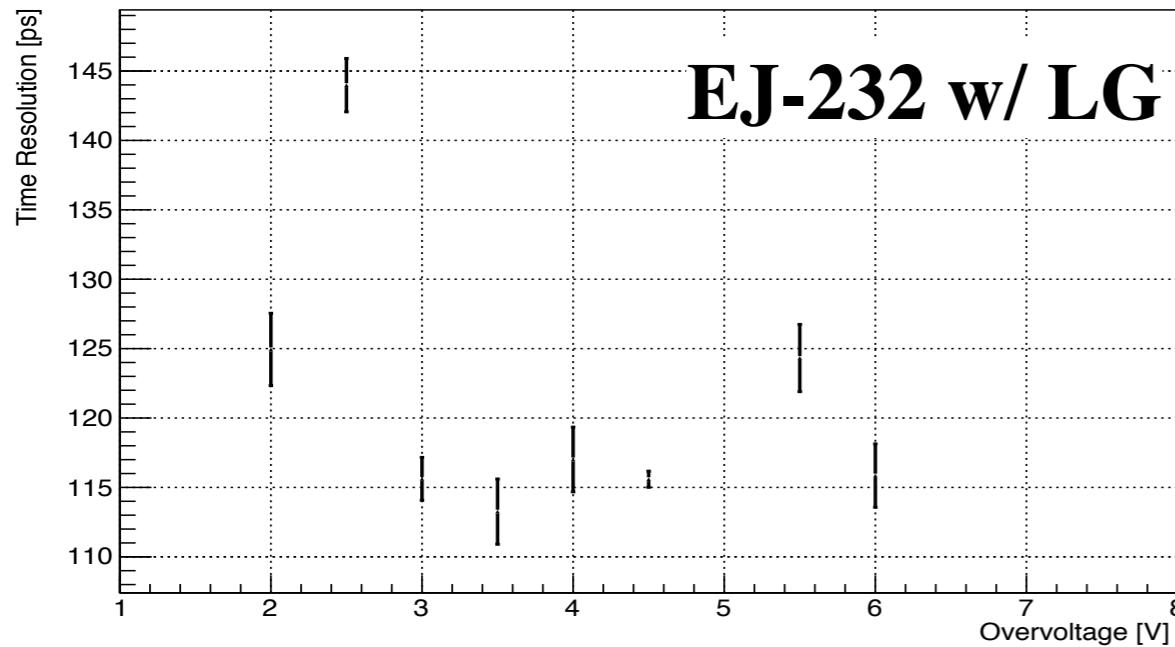
BACKUP

BIAS VOLTAGE DEPENDENCE

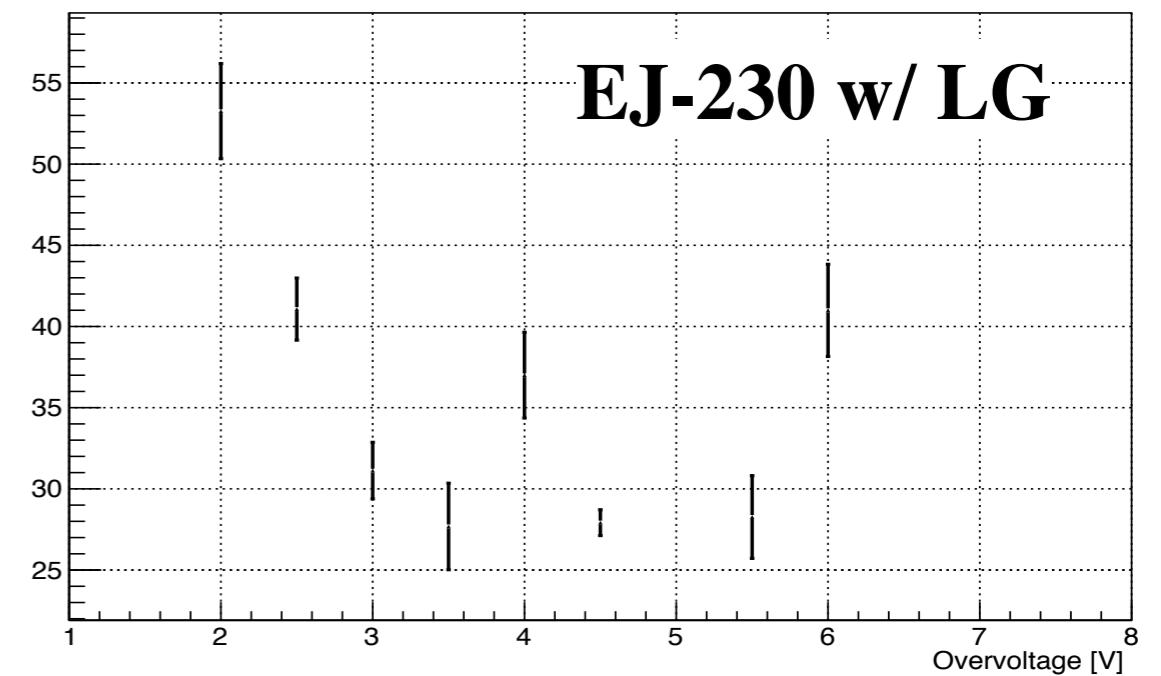
Time resolution of several voltage conditions



Time resolution of several voltage conditions



Time resolution of several voltage conditions

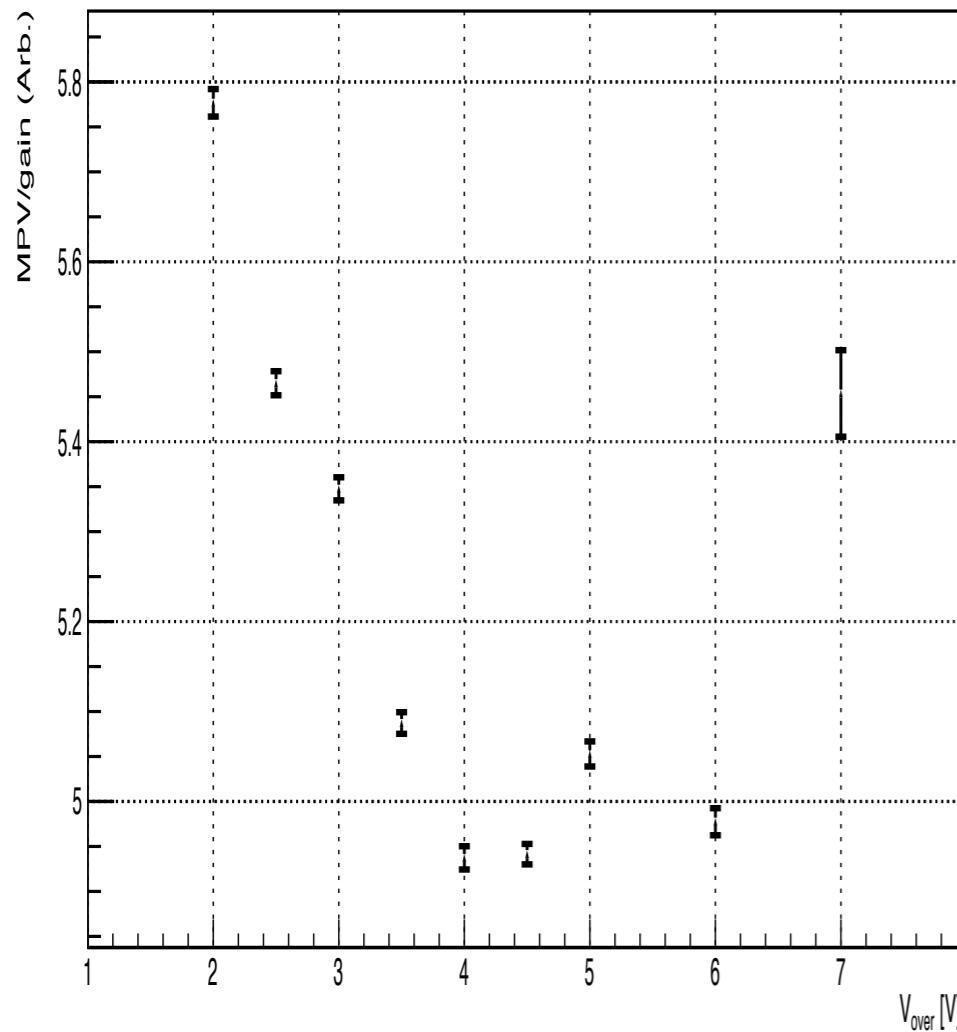


MPV/GAIN

PDE α (MPV/Gain)

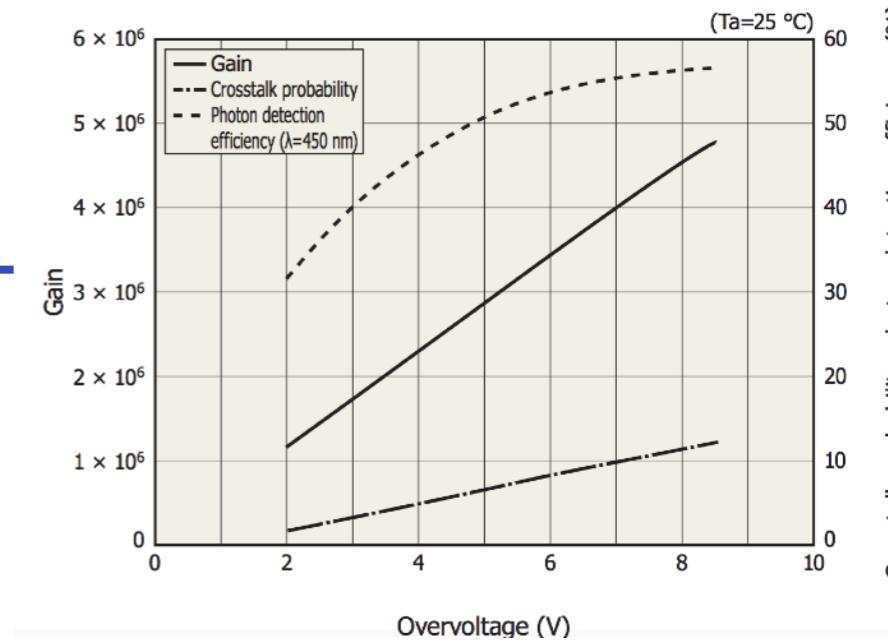
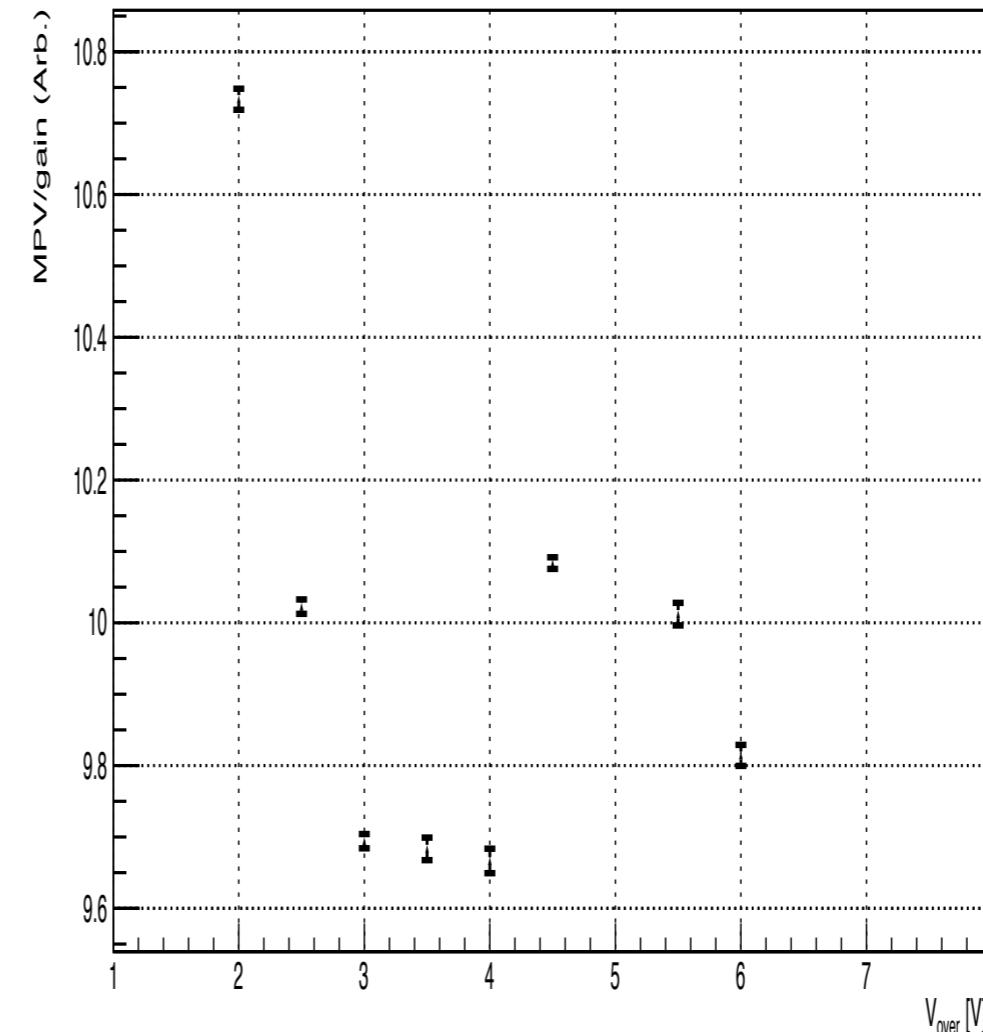
EJ-232 w/o LG

MPV/gain



EJ-232 w/ LG

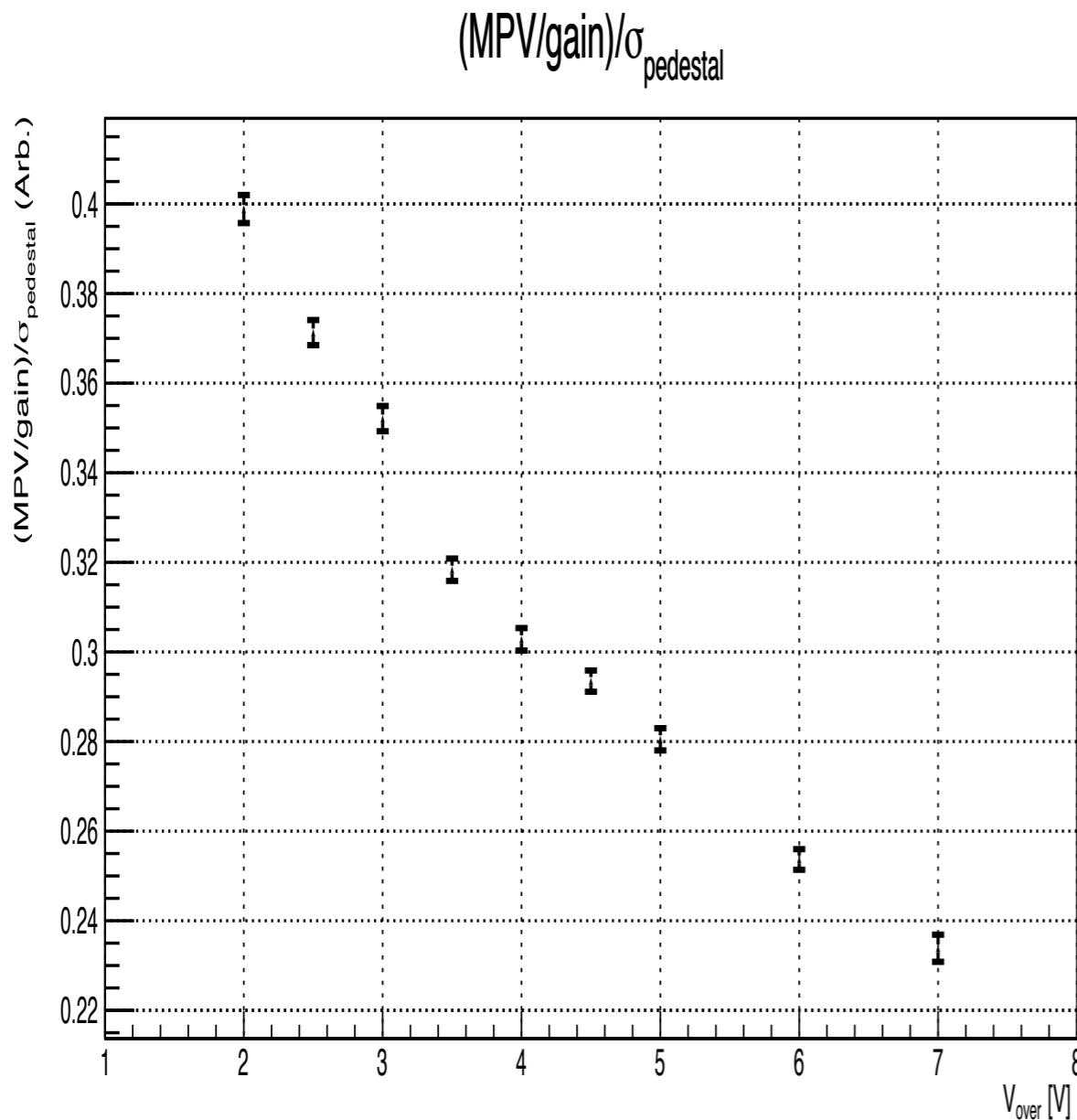
MPV/gain



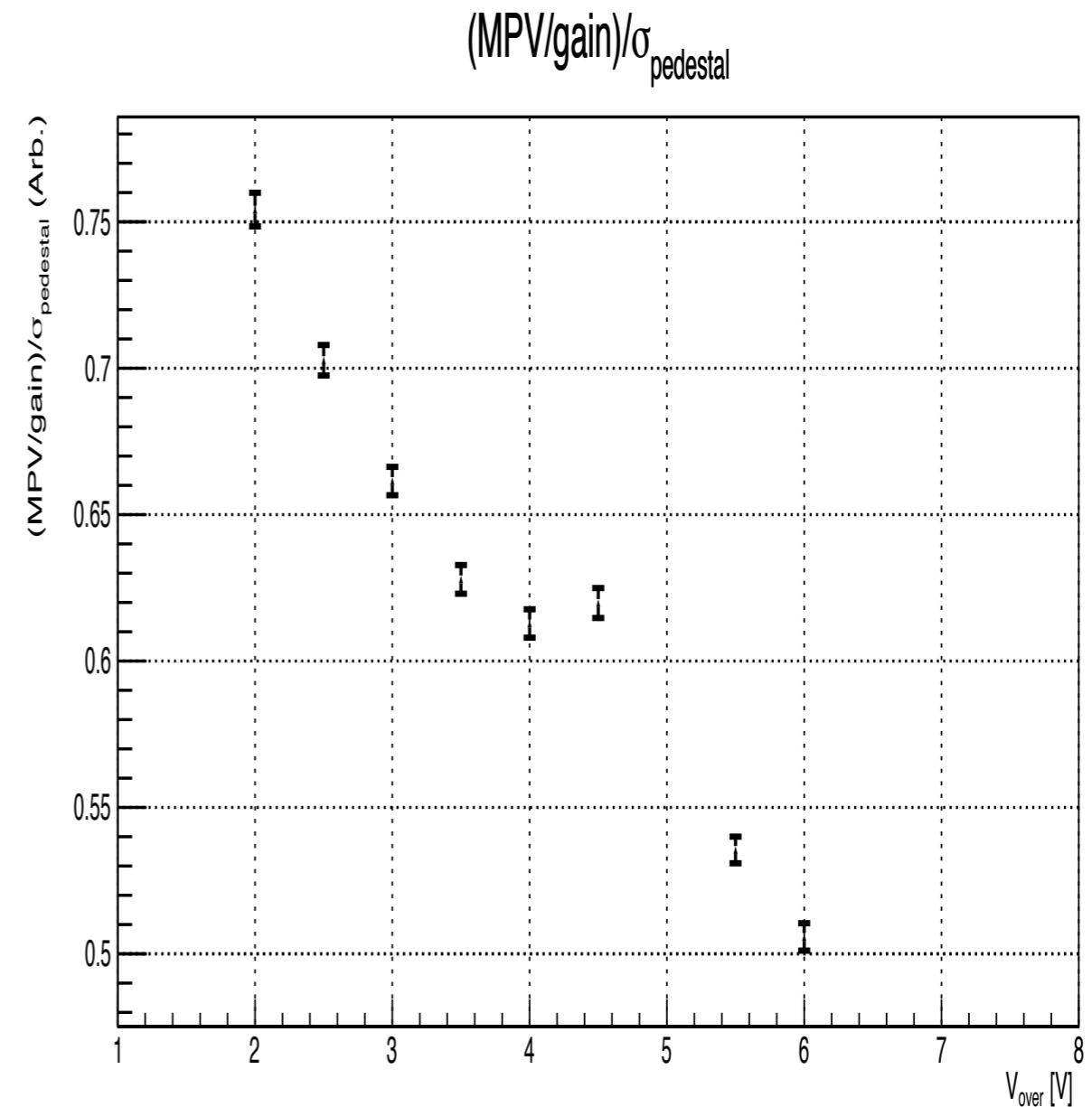
$(\text{MPV}/\text{GAIN})/\sigma_{\text{pedestal}}$

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

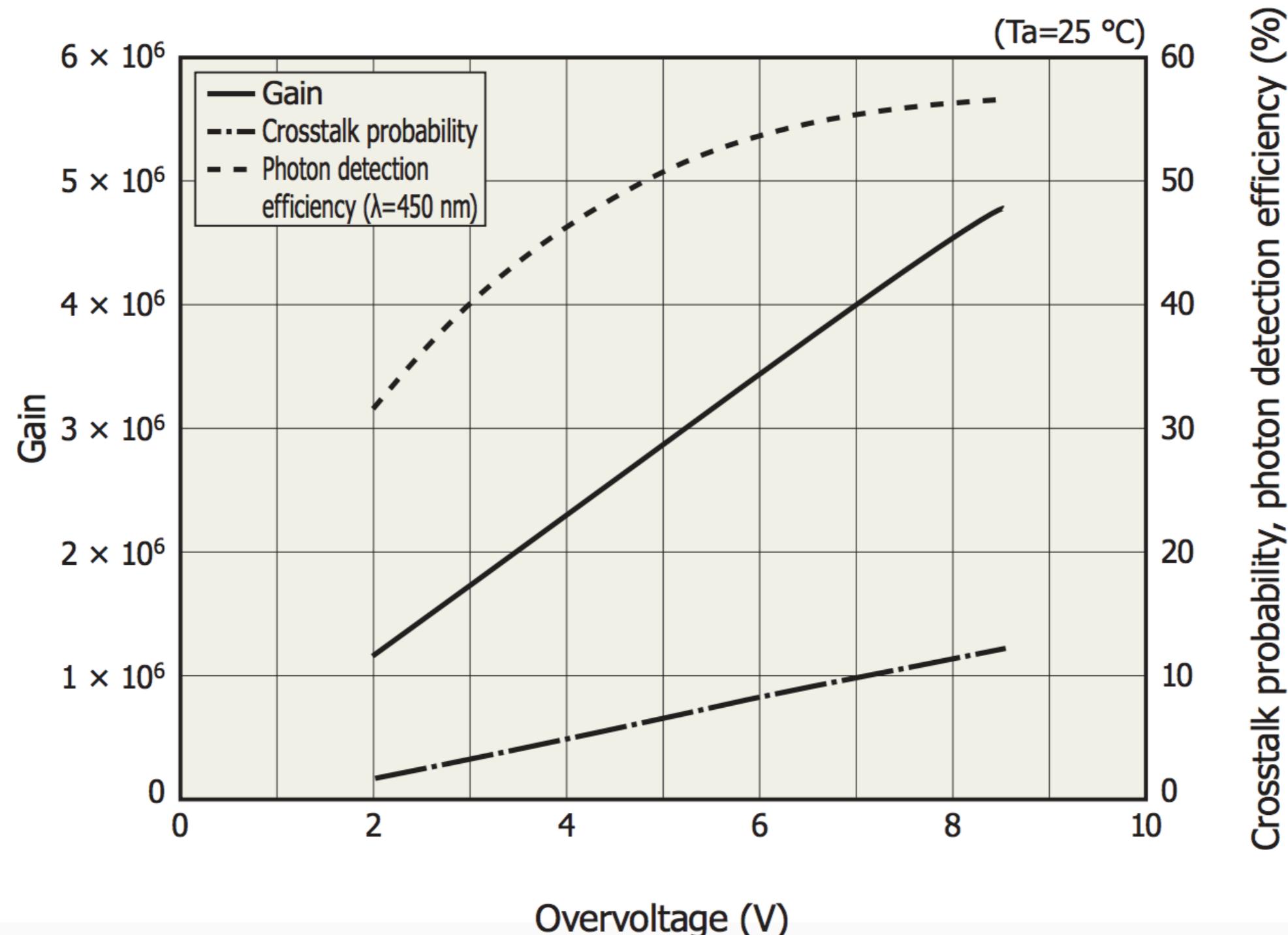
EJ-232 w/o LG



EJ-232 w/ LG

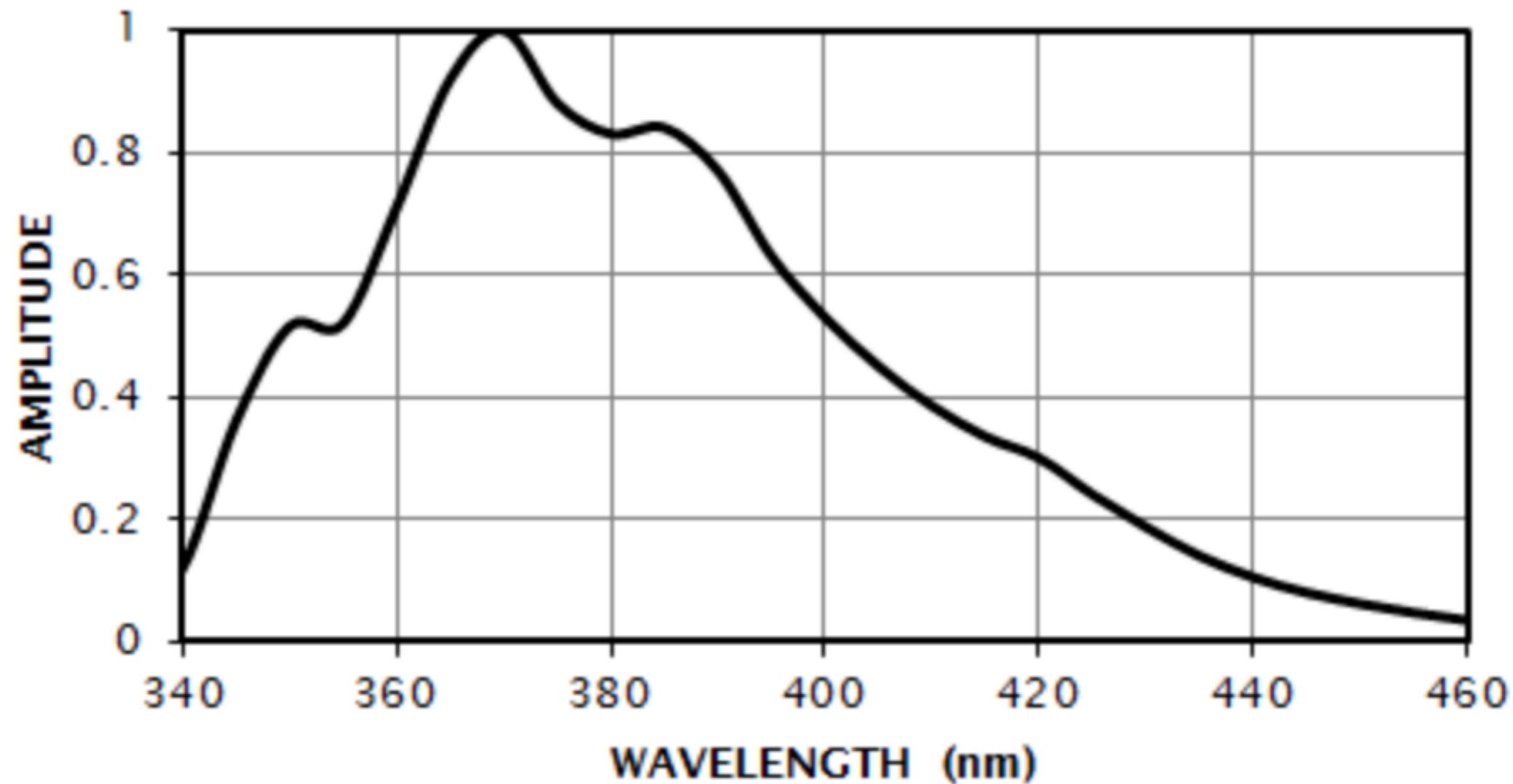


13360-3050PE



EJ-232

EJ-232 AND EJ-232Q EMISSION SPECTRUM



SUMMARY

Test results

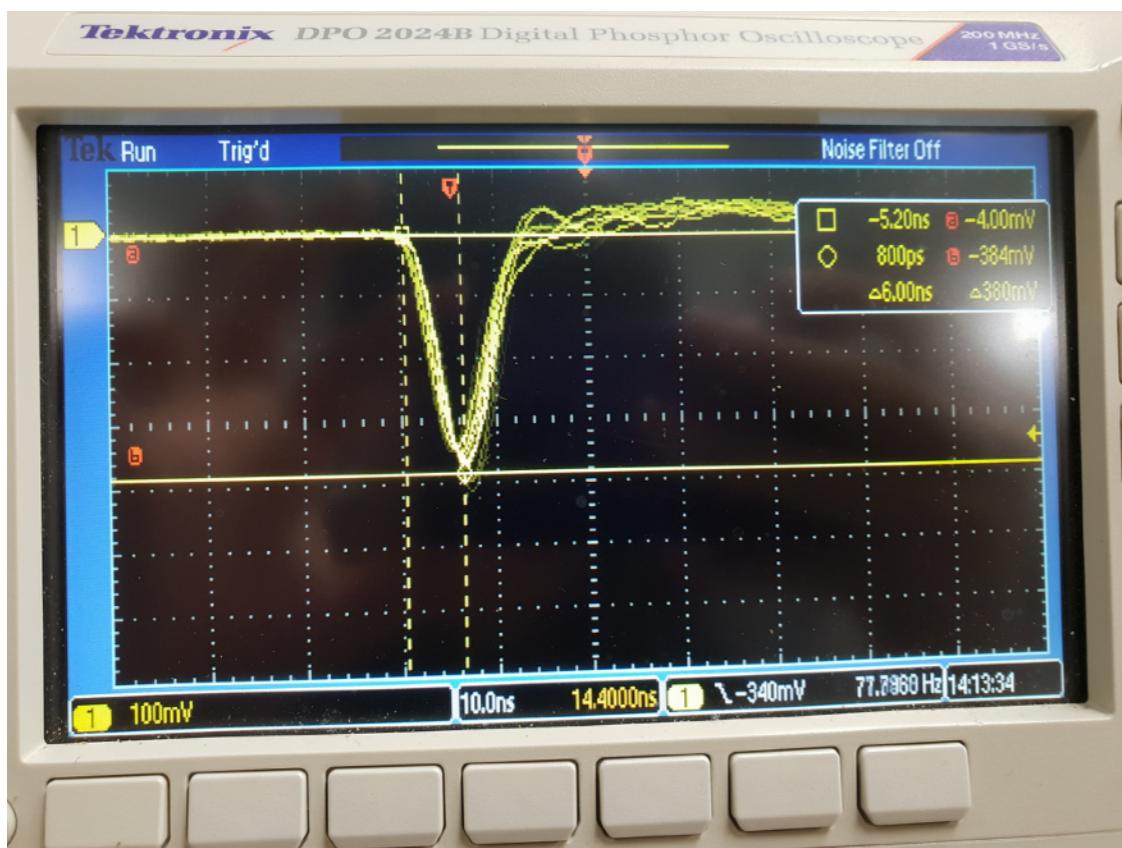
Scinti.	velocity	Propagation			w/o light-guides			w/ light-guides		
		Res. (ps)	MPV(ch)	atten. (cm)	Res. (ps)	MPV(ch)	atten. (cm)	Res. (ps)	MPV(ch)	atten. (cm)
EJ-200	16.5 cm/ns	174 +/- 1	588	55.4 +/- 0.1						
EJ-230	16.3 cm/ns	156 +/- 1	720	90.1 +/- 0.2	125 +/- 1	1380	246.6 +/- 1.5			
EJ-232	16.3 cm/ns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



EJ-230 w/ light guide



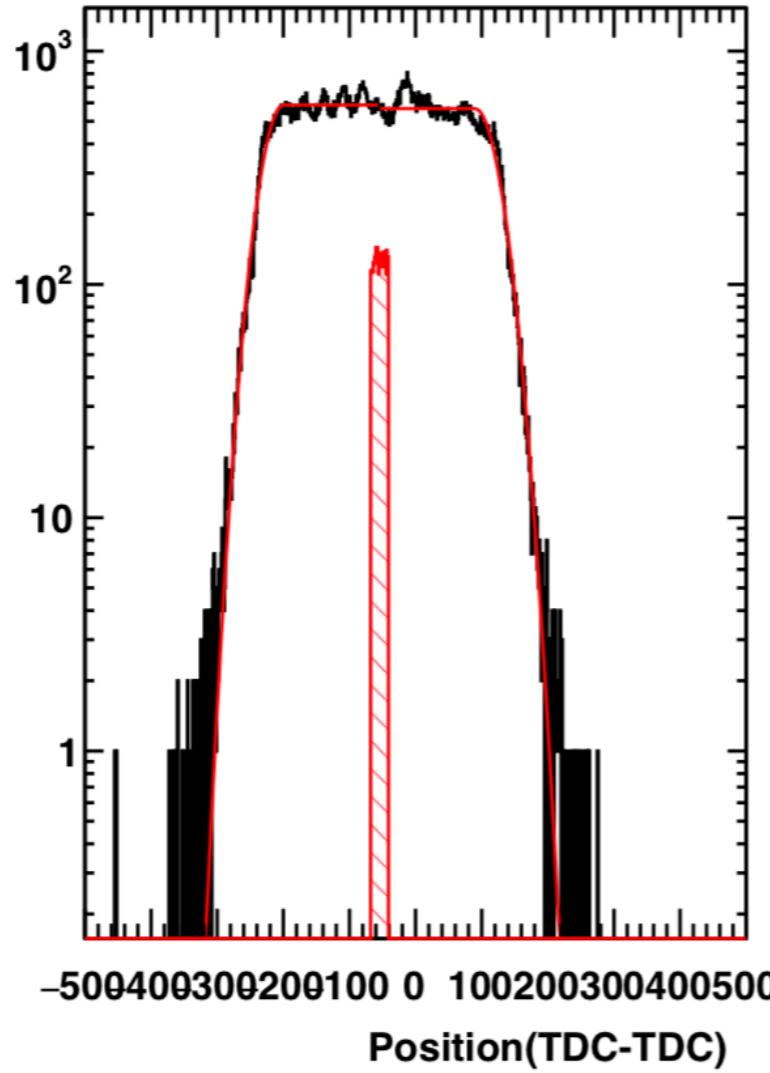
rise time \sim 6 ns

rise time \sim 6 ns

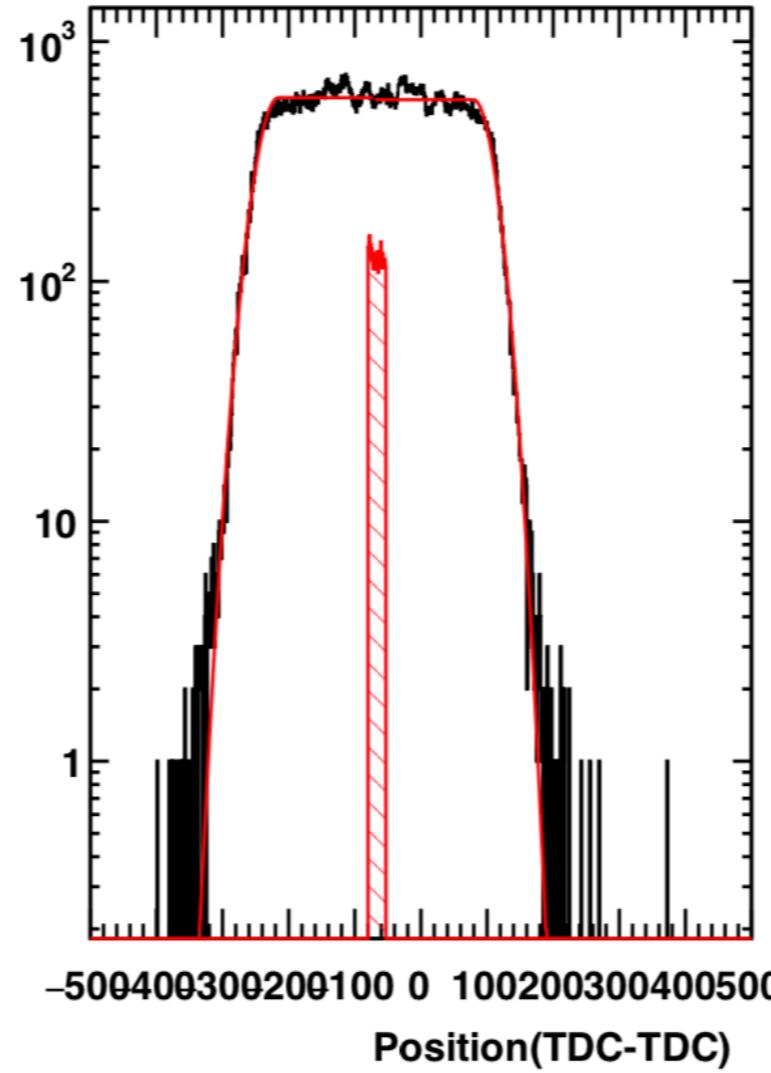
EVENT SELECTION

Selected the events corresponding to 8 cm region

position distribution, Hodo PMT1



position distribution, Hodo PMT2



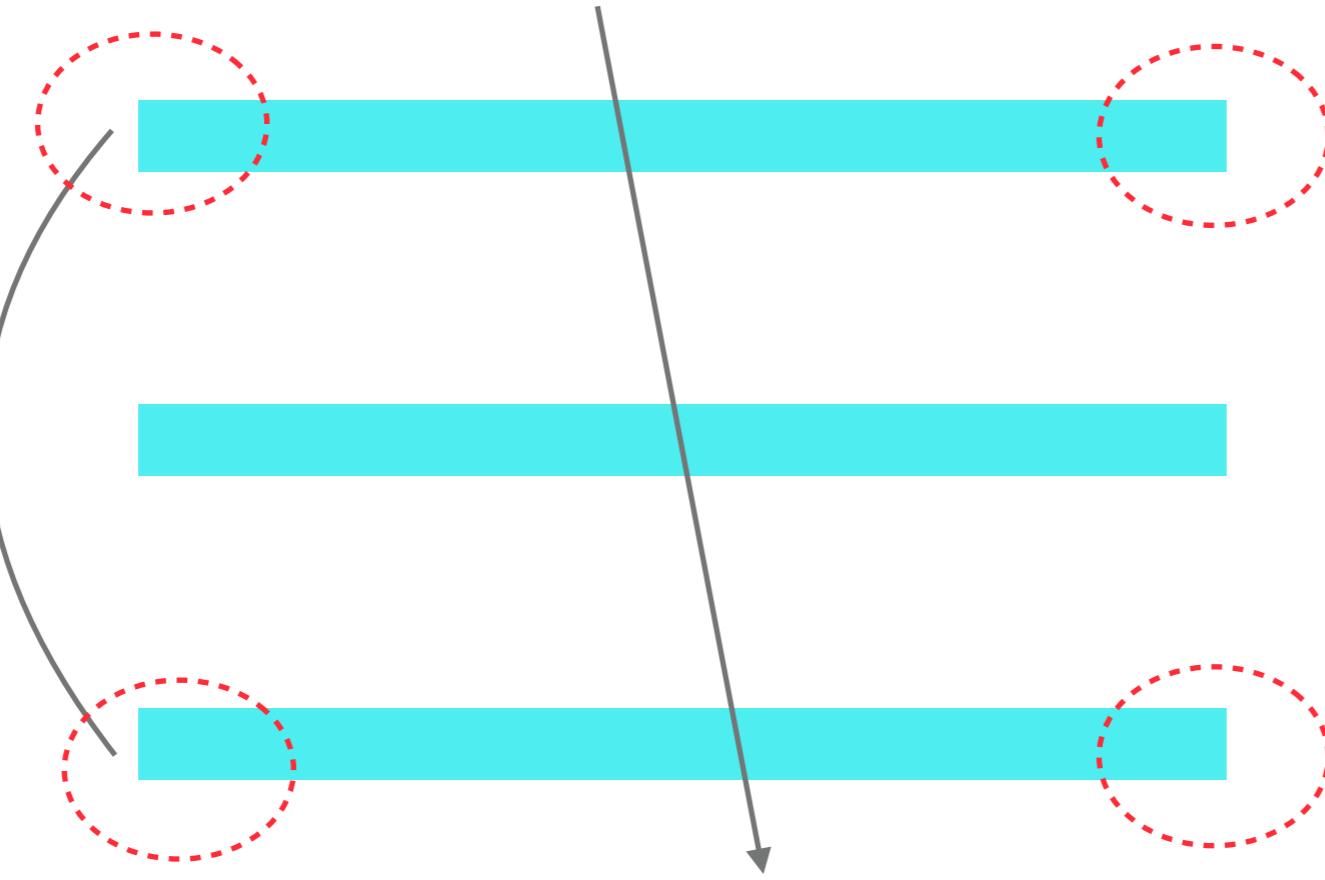
Fitting functions

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

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

TIMEWALK CORRECTION

Steps

- 
- The diagram illustrates two horizontal cyan bars representing time-of-flight (TOF) signals. Each bar has four dashed red circles around its ends and middle. A curved arrow starts from the left end of the top bar and points to the left end of the bottom bar. Another arrow points from the right end of the top bar towards the right end of the bottom bar.
- 1. Get tof**
 - 2. Timewalk correlation of tof with the four ADCs.**
 - 3. Repeat the same way for all three tofs.**

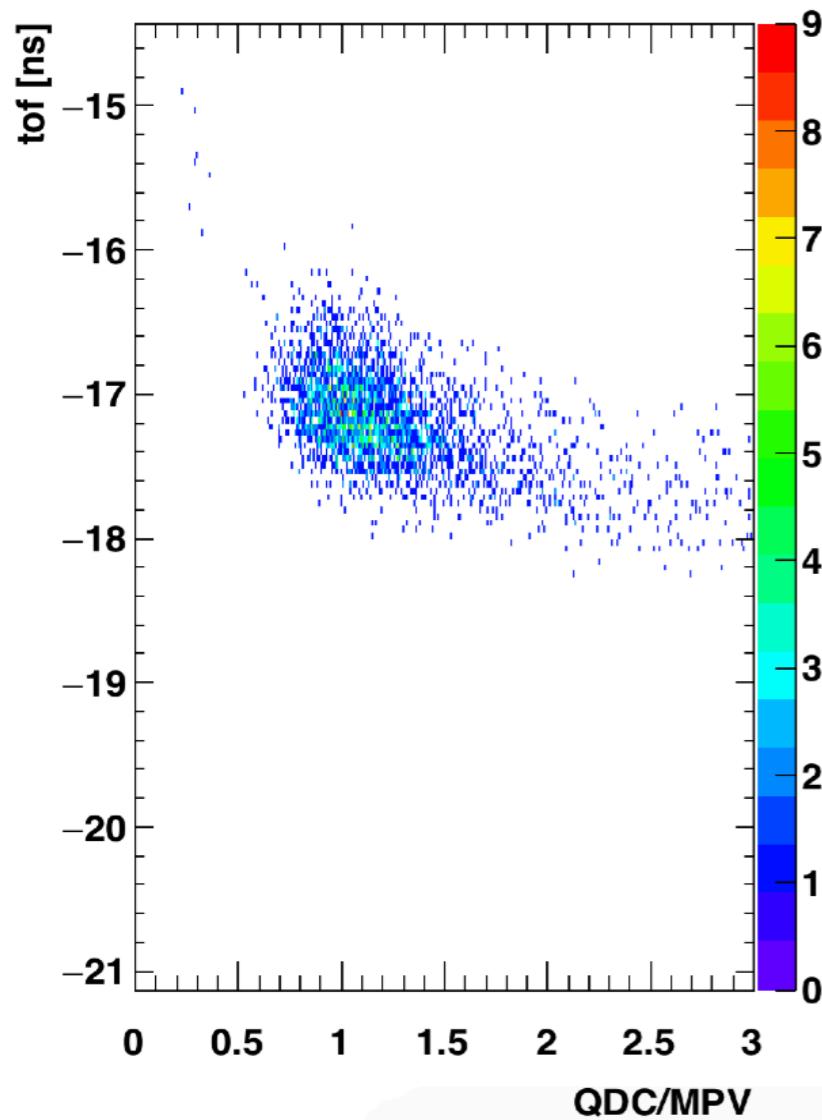
TIMEWALK CORRECTION

Timewalk correction

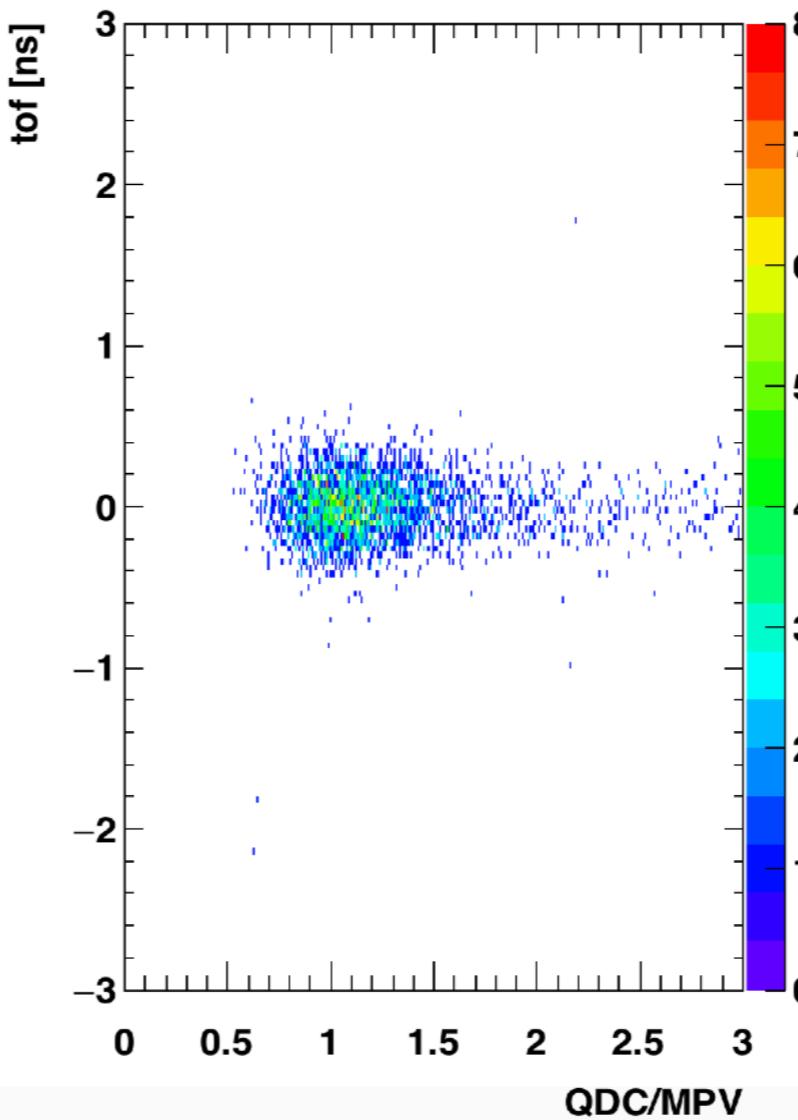
$$t' = t + \frac{a}{\sqrt{Q - Q_0}}$$

Red line : TOF distribution
after time walk correction

TOF_{Hodo ~ PMT1} : QDC_{left PMT}



TOF_{Hodo ~ PMT1} : QDC_{left PMT}



TOF_{Hodo MPPC ~ Hodo PMT1}

