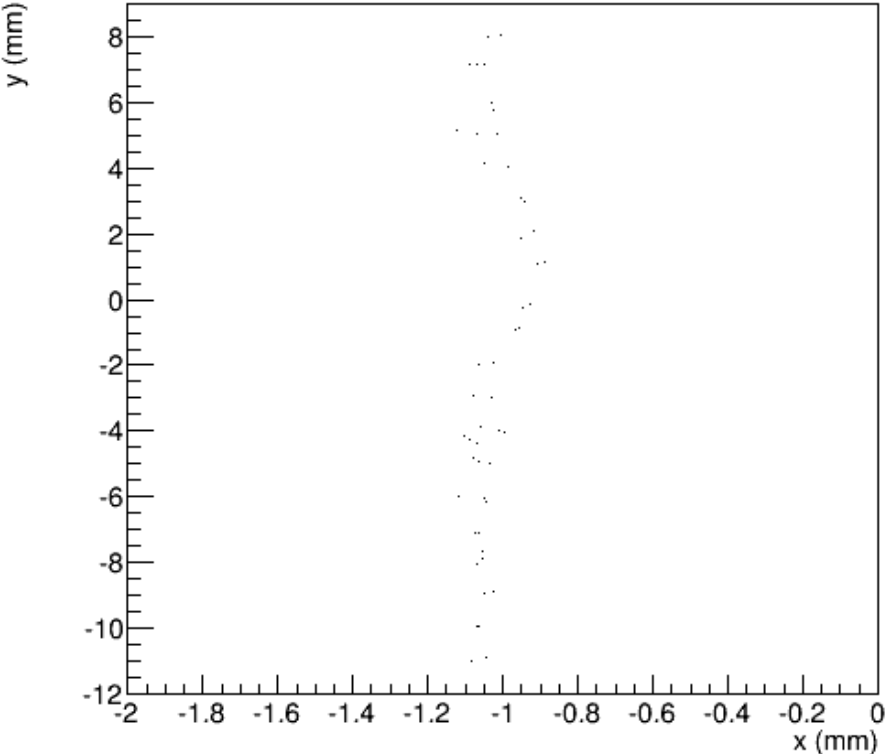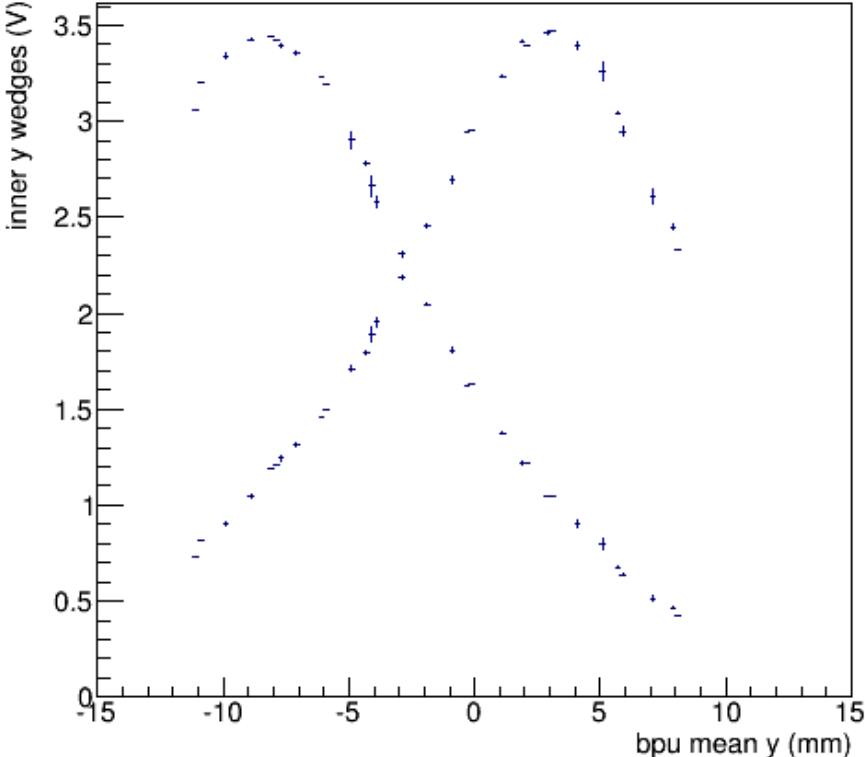# beam scan in y by accelerator controls

scan coordinates for ybeamscan2-11-07_rad_2e-5.txt
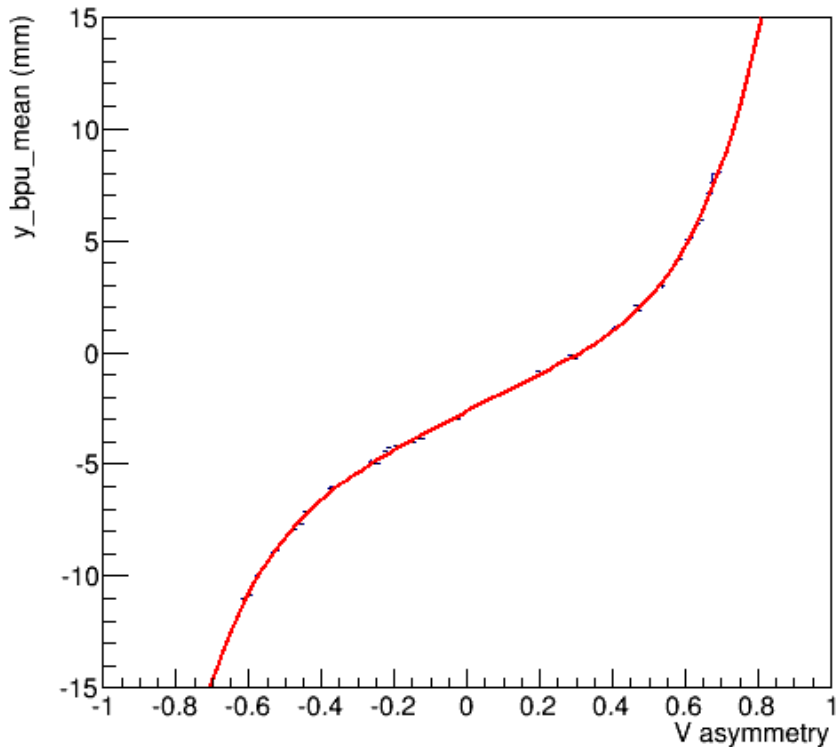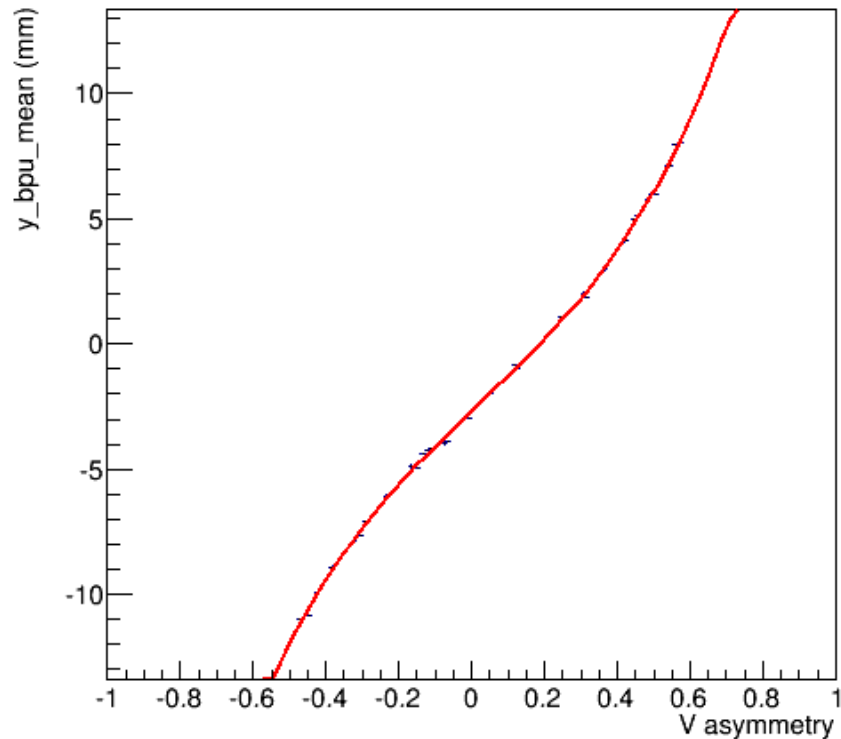
burt scan ybeamscan2-11-07_rad_2e-5.txt

active collimator opposite y-wedge asymmetry

burt scan ybeamscan2-11-07_rad_2e-5.txt

burt scan ybeamscan2-11-07_rad_2e-5.txt

consistency of active collimator response with active target rate

active target y beam scan

χ^2 / ndf	7.085e+07 / 10	
Constant	$2.034e+05 \pm 0.5$	
Mean	-2.603 ± 0.000	
Sigma	3.975 ± 0.000	

inner wedges 5-th order poly fit:

p0	=	**-2.61809**
p1	=	8.37568
p2	=	-1.30637
p3	=	1.47959
p4	=	0.615187
p5	=	31.0245

outer wedges 5-th order poly fit:

p0	=	**-2.68086**
p1	=	13.9037
p2	=	-0.712466
p3	=	15.3233
p4	=	-0.758043
p5	=	4.94836

beam scan in x by accelerator controls

scan coordinates for xbeamscan2-11-07_rad_2e-5.txt
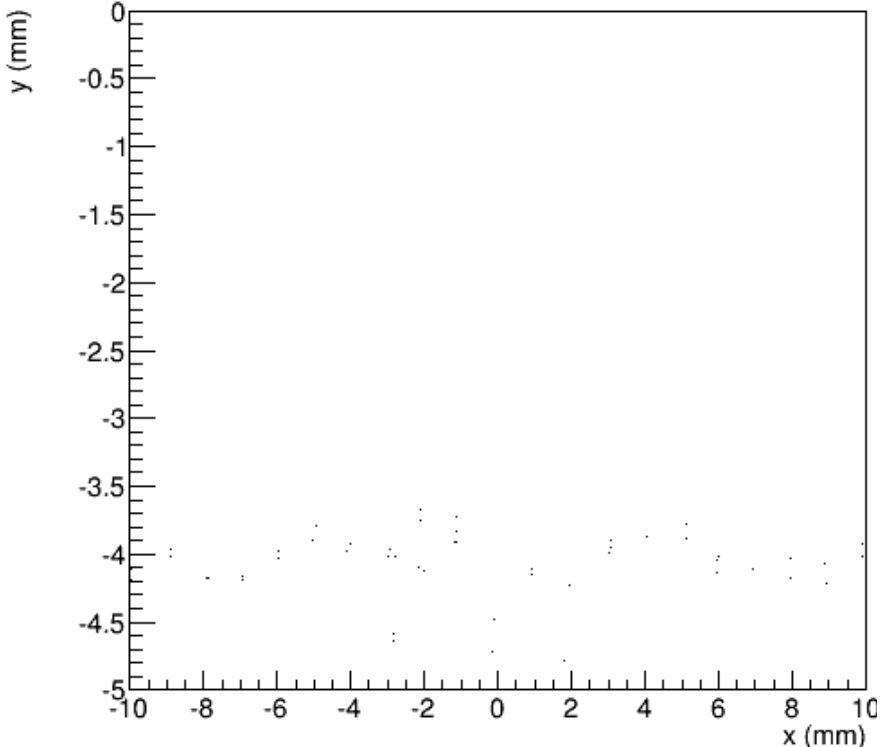
burt scan xbeamscan2-11-07_rad_2e-5.txt
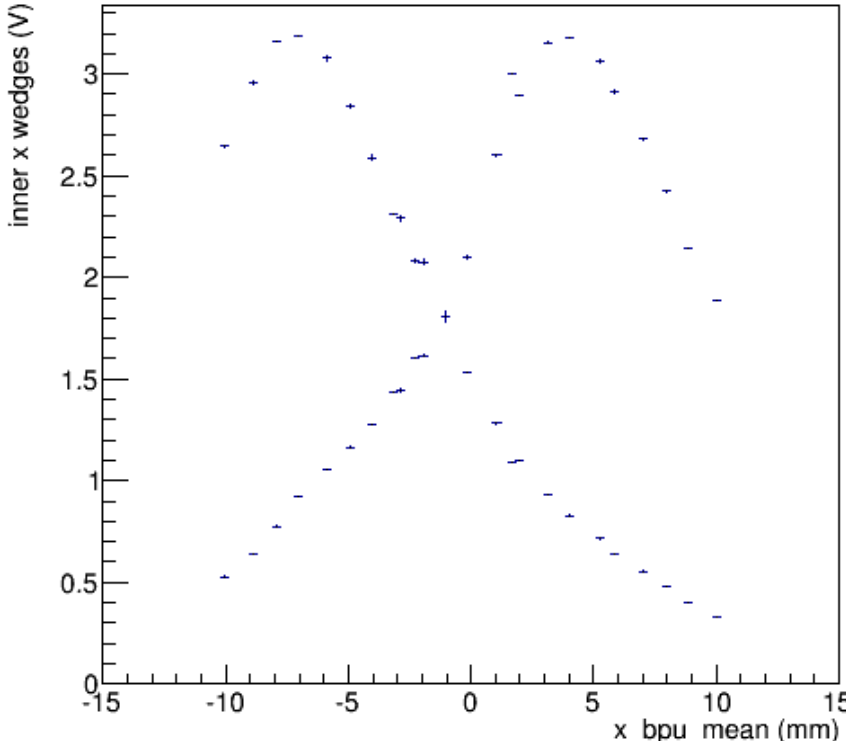
active collimator opposite x-wedge asymmetry

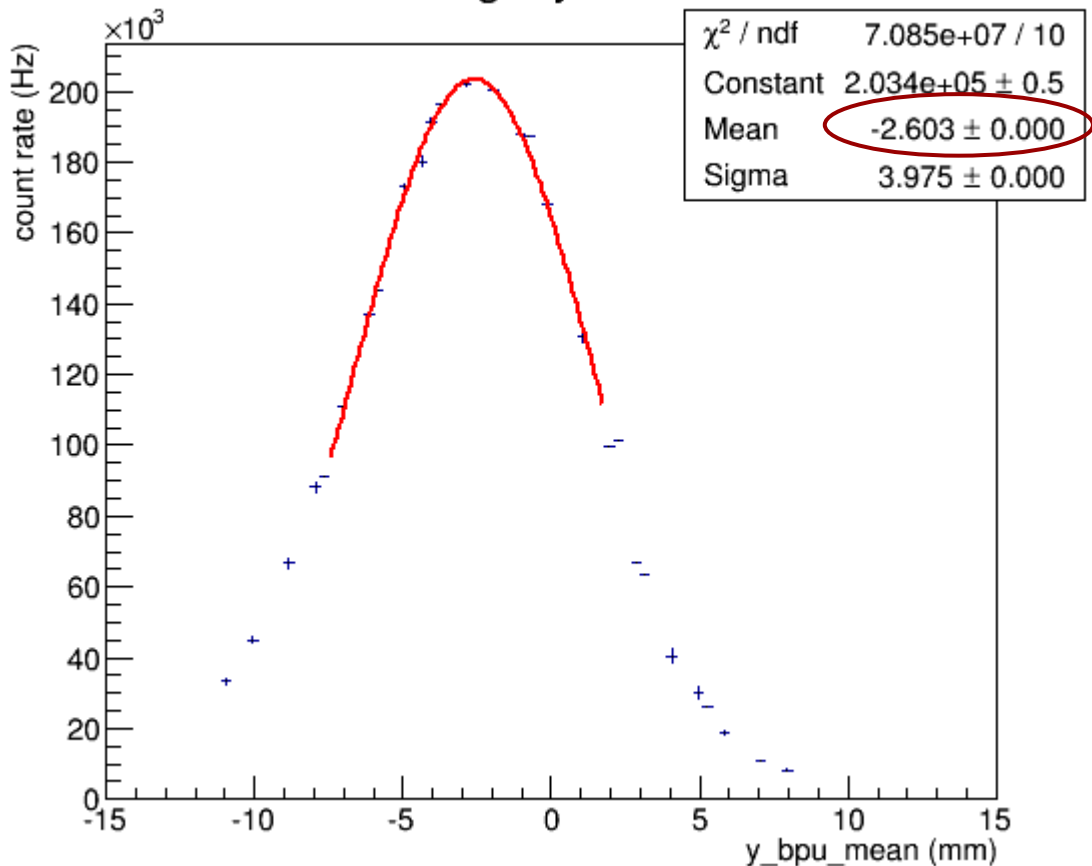burt scan xbeamscan2-11-07_rad_2e-5.txt

consistency of active collimator response with active target rate
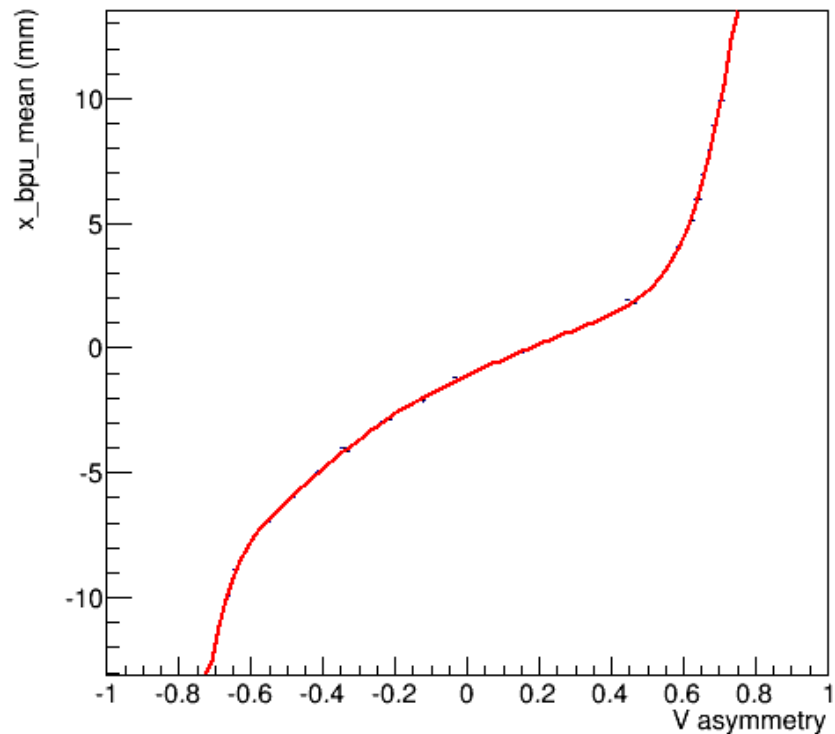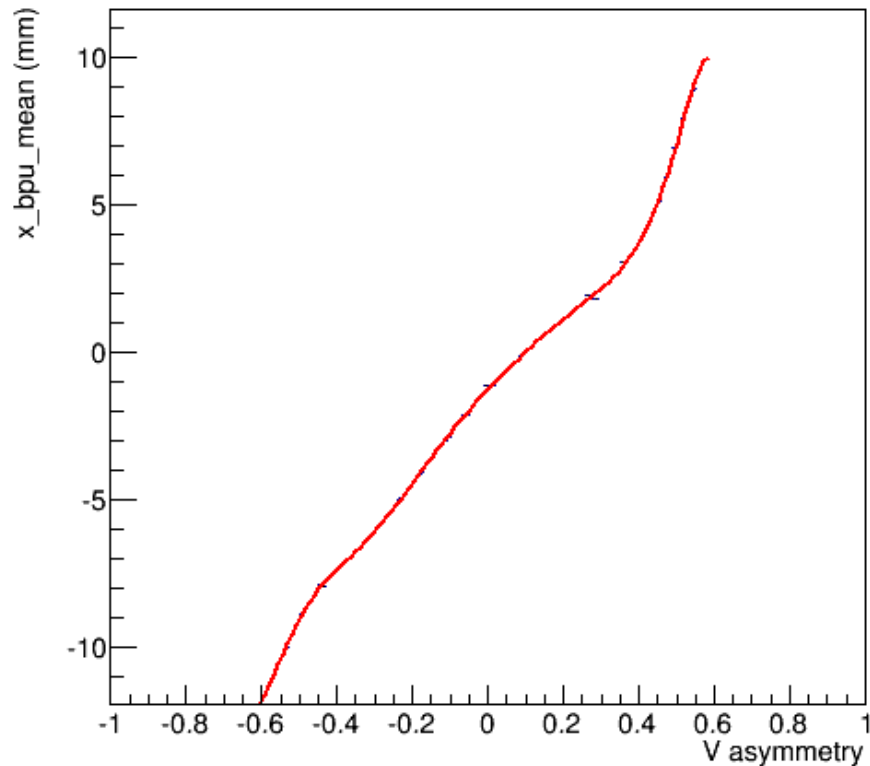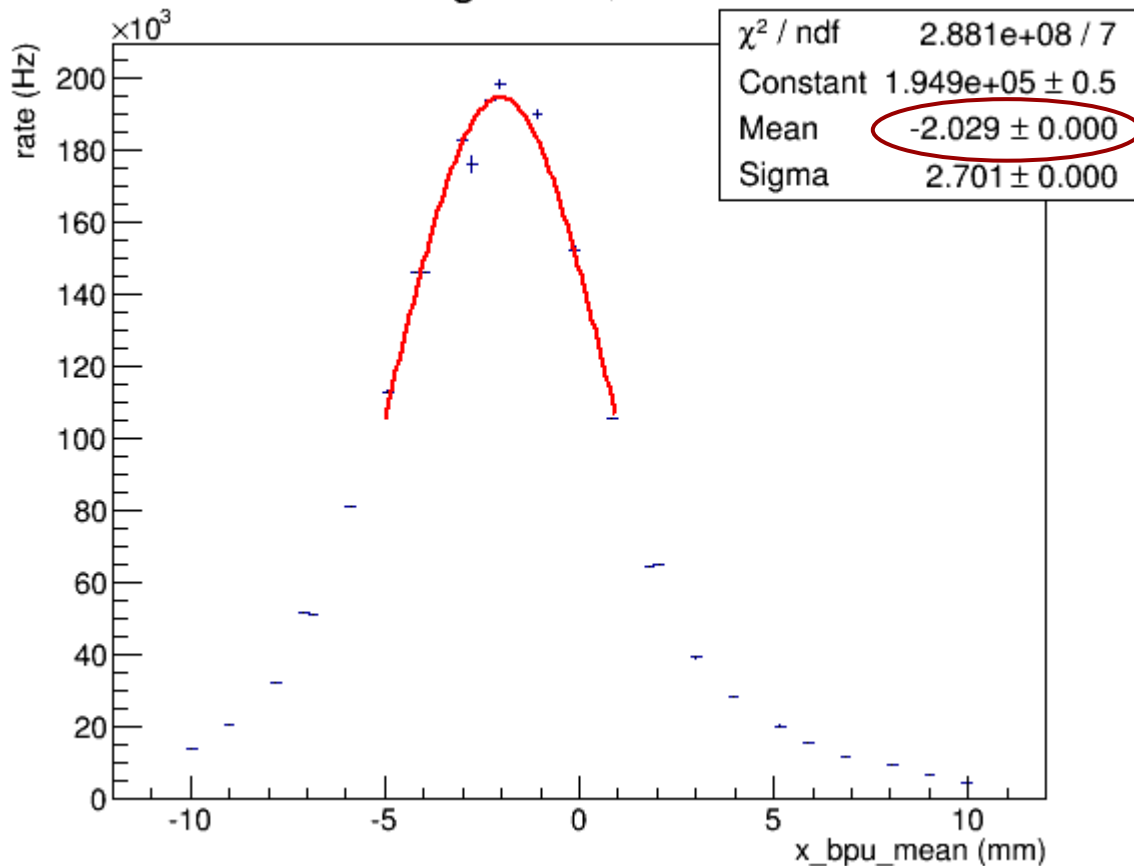

active target rate, x beam scan

χ^2 / ndf	2.881e+08 / 7
Constant	1.949e+05 ± 0.5
Mean	-2.029 ± 0.000
Sigma	2.701 ± 0.000

inner wedges 9-th order poly fit:

p0	=	**-1.09726**
p1	=	6.69017
p2	=	-2.46311
p3	=	8.26661
p4	=	-26.094
p5	=	-15.0744
p6	=	122.846
p7	=	4.92317
p8	=	-120.196
p9	=	132.999

outer wedges 9-th order poly fit:

p0	=	**-1.2326**
p1	=	13.4929
p2	=	-11.0958
p3	=	25.7308
p4	=	8.00035
p5	=	-452.947
p6	=	374.782
p7	=	2495.24
p8	=	-848.404
p9	=	-3712.06

~~beam~~ collimator scan in x by ~~accelerator~~ motor controls

scan coordinates for beam_0018.asc.root

unfortunate step
right in middle of scan
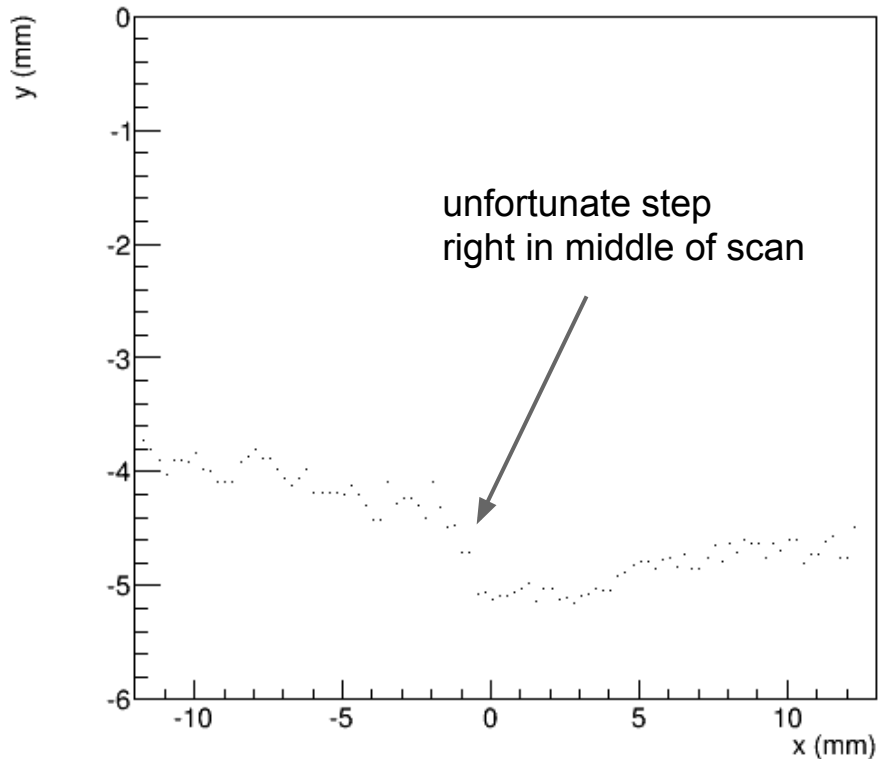
collimator scan beam_0018.asc.root

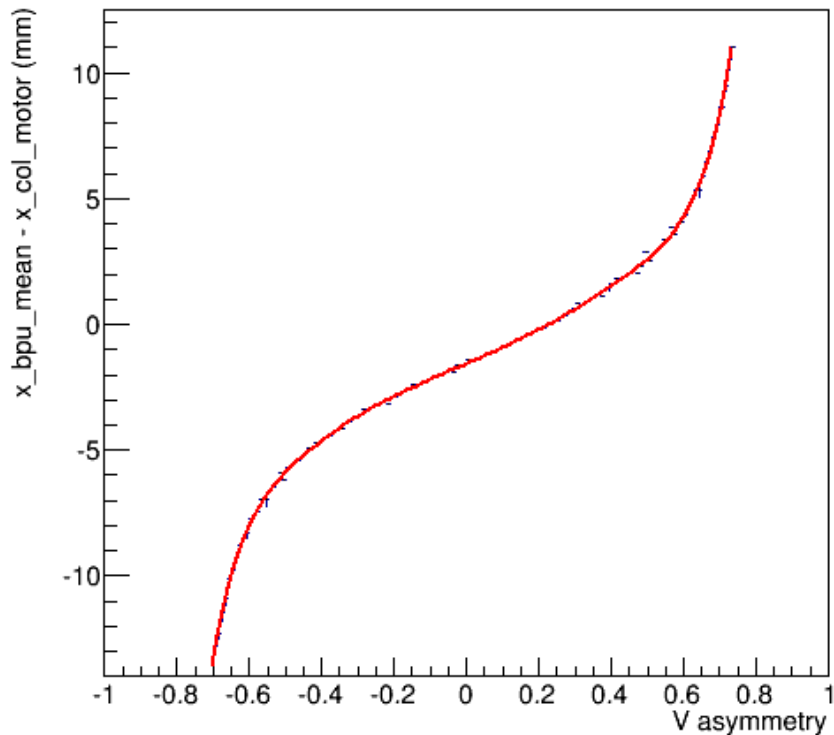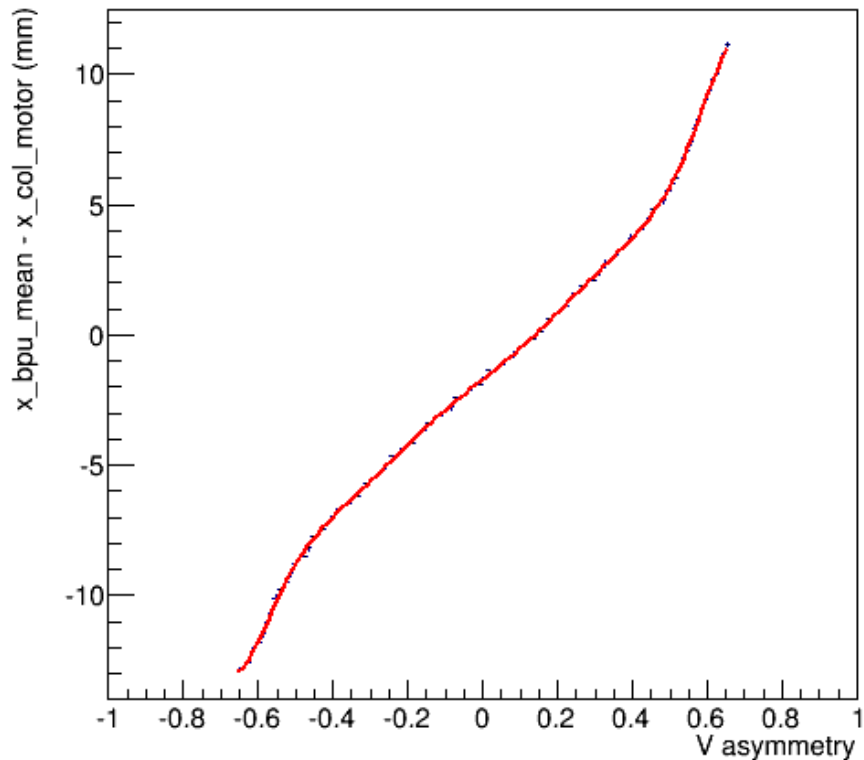# active collimator opposite x-wedge asymmetry

collimator scan beam_0018.asc.root

collimator scan beam_0018.asc.root

active collimator response is much more smooth and symmetric with collimator motor scans!

active collimator opposite x-wedge asymmetry vs Xbeam-Xcol

fit: x-wedge asymmetry → x of beam in collimator coordinates

inner x-wedges			outer x-wedges		
p0	=	**-1.54026**	p0	=	**-1.6961**
p1	=	6.30612	p1	=	11.3452
p2	=	0.301719	p2	=	0.632244
p3	=	8.42805	p3	=	46.9961
p4	=	-0.736145	p4	=	-2.63319
p5	=	10.2121	p5	=	-423.482
p6	=	-5.50989	p6	=	7.26192
p7	=	-97.3332	p7	=	1595.65
p8	=	-4.79739	p8	=	10.9569
p9	=	243.495	p9	=	-1807.57

Rule of thumb during initial running was that the beam is centered when the beam center of gravity on the profiler is at (-1, -4) mm.

now check fit using opposite y-wedge calibration against y_bpu

collimator scan beam_0018.asc.root

inner acol wedges
outer acol wedges
y from profiler

y from acol y-asym (mm)

X_bpu_mean - x_col_motor (mm)
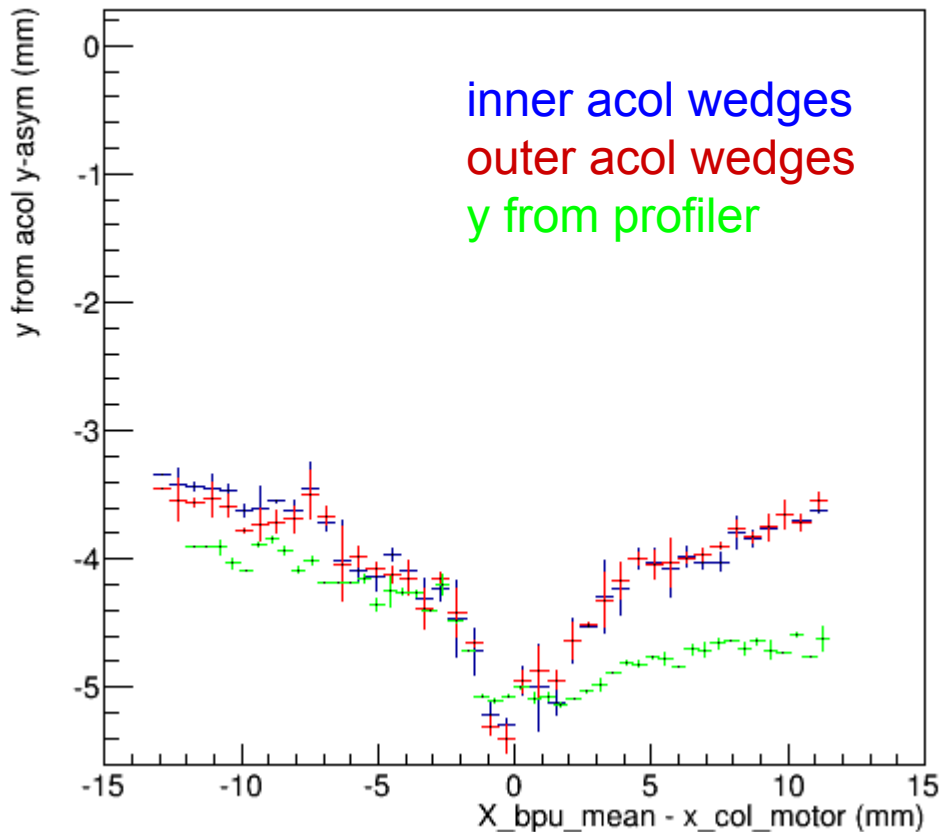
2D calibration is needed

1. dA/dy depends on x

2. good central region ±3mm where x,y approx. decoupled

3. excellent agreement between inner / outer wedges.

Why the tilt?

1. active collimator is tilted?

2. beam ellipse is tilted?

3. profiler is sensitive to beam components (eg. X-rays) not seen by active collimator?