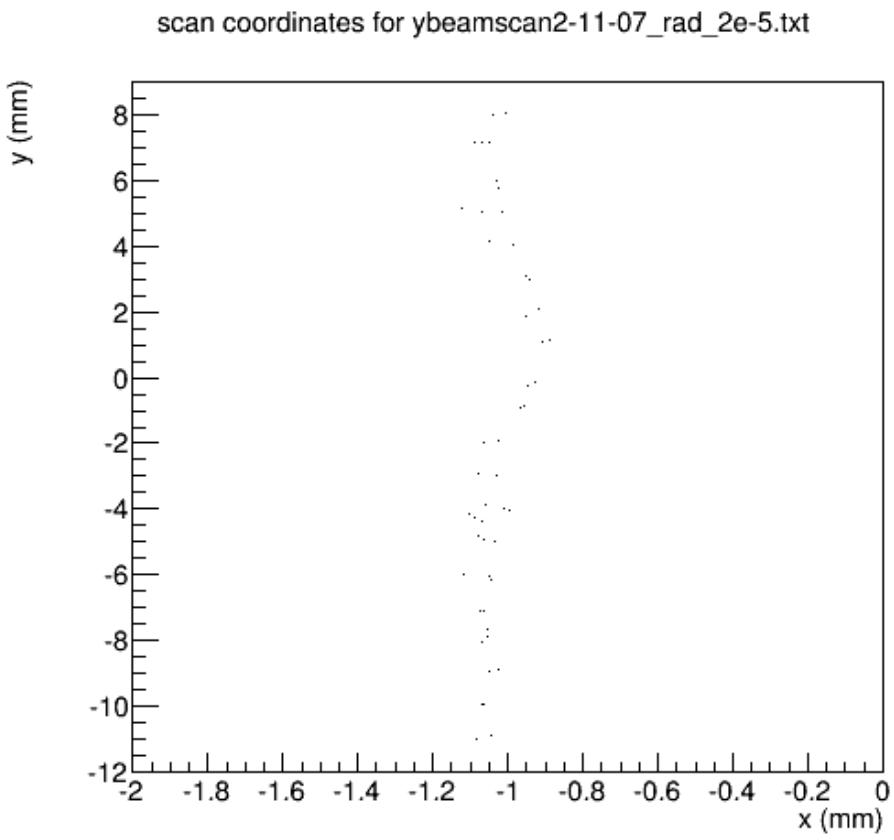
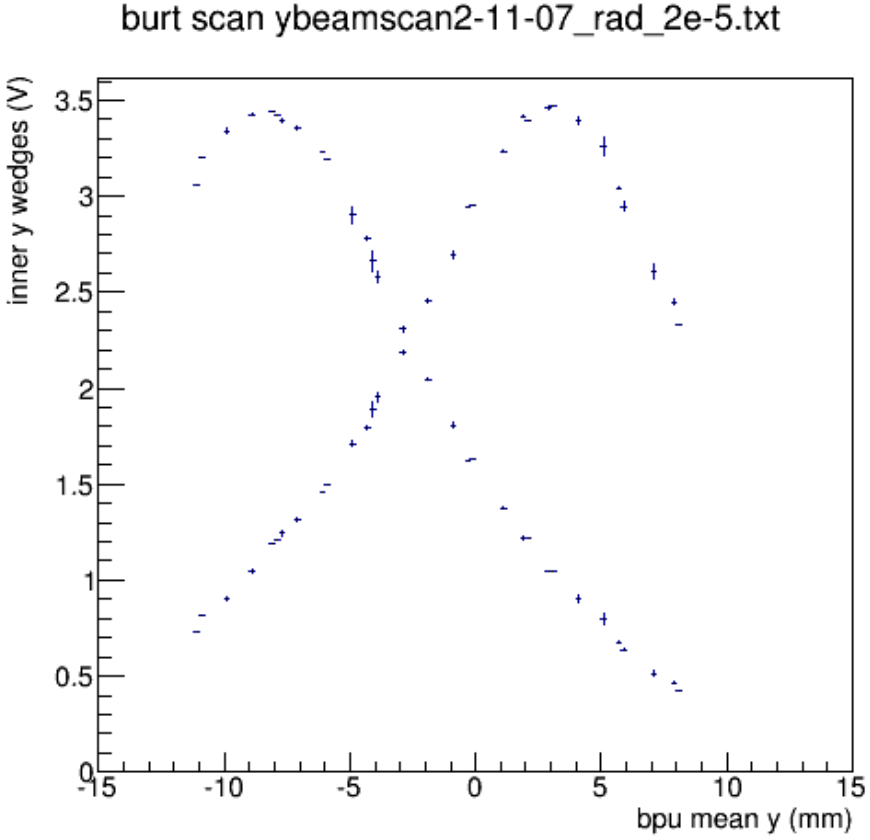
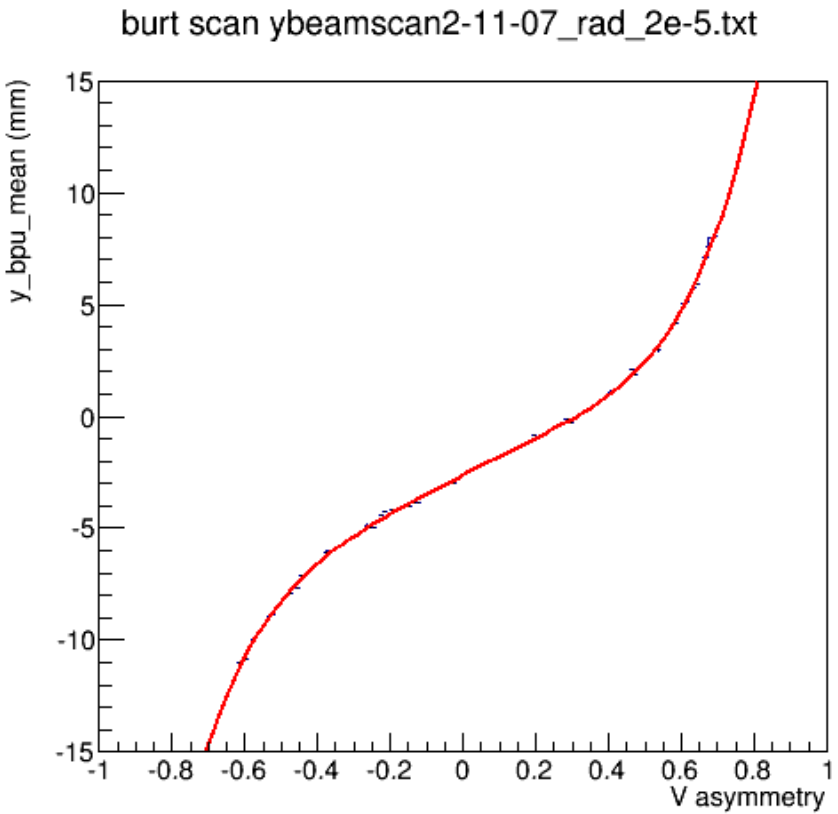
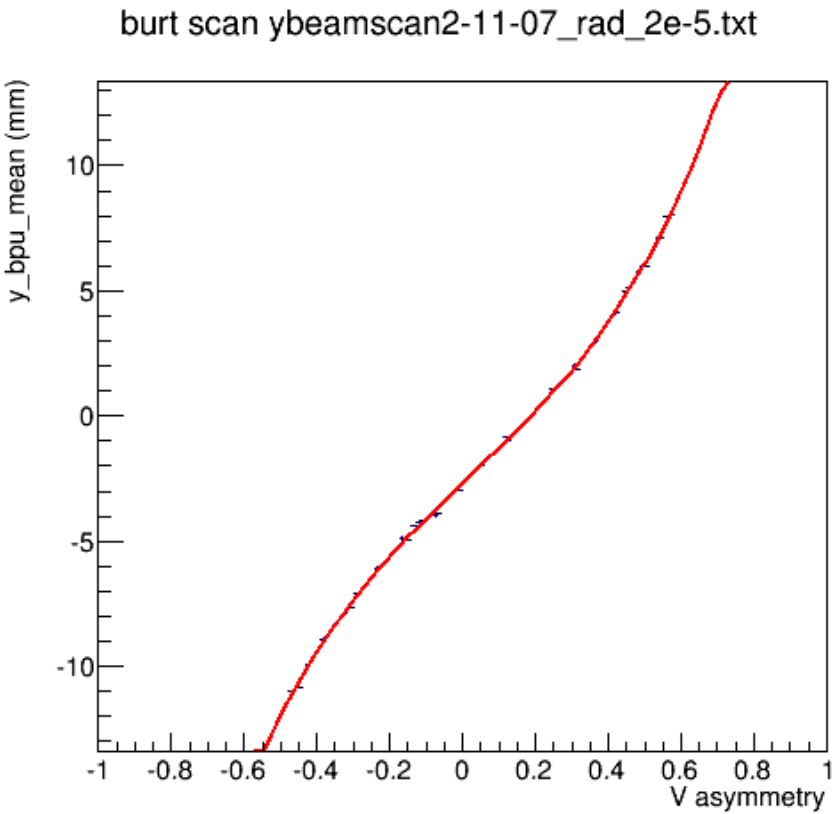
beam scan in y by accelerator controls



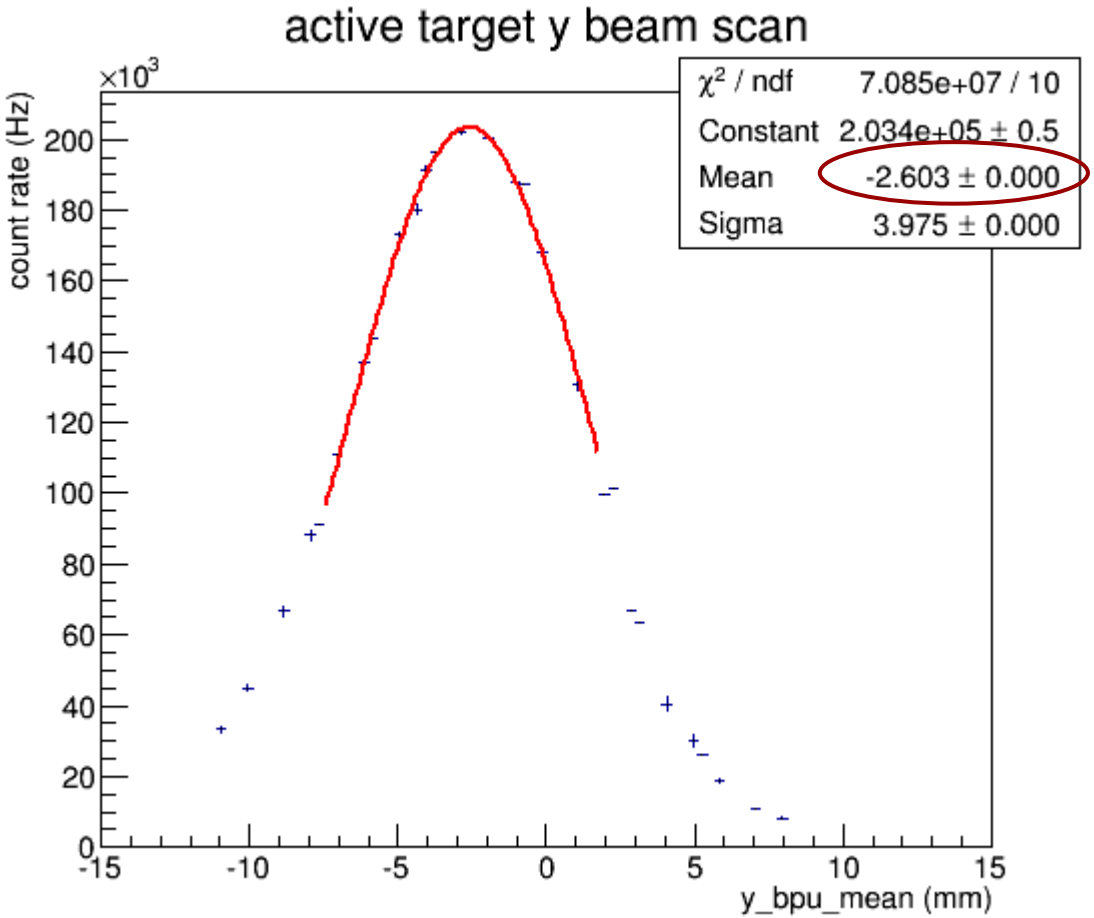


active collimator opposite y-wedge asymmetry





consistency of active collimator response with active target rate



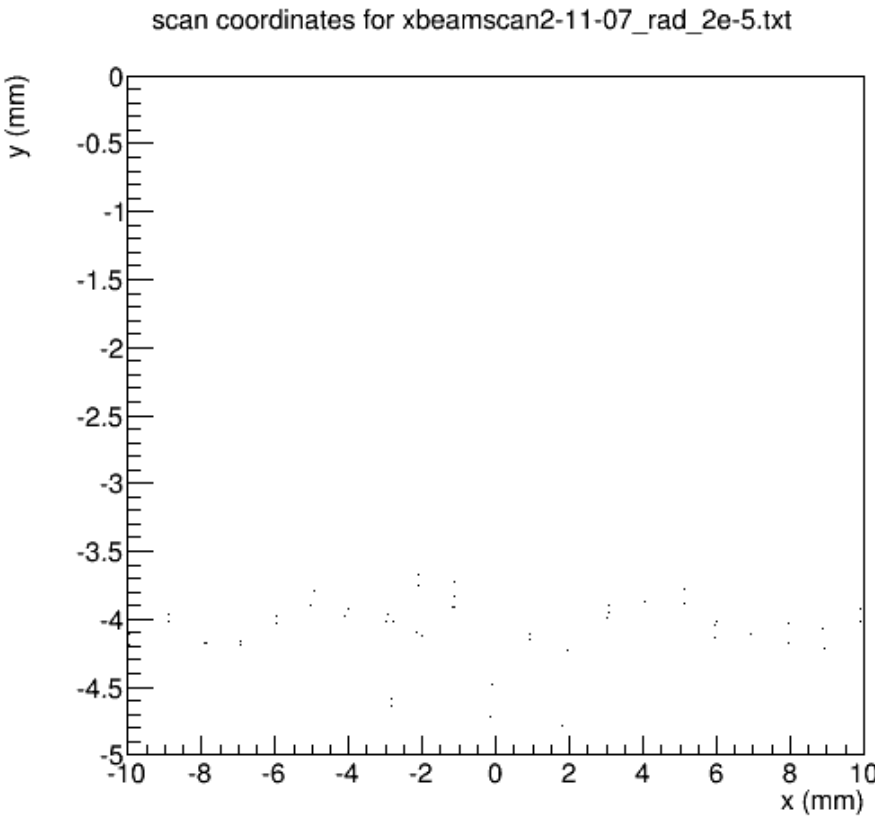
inner wedges 5-th order poly fit:

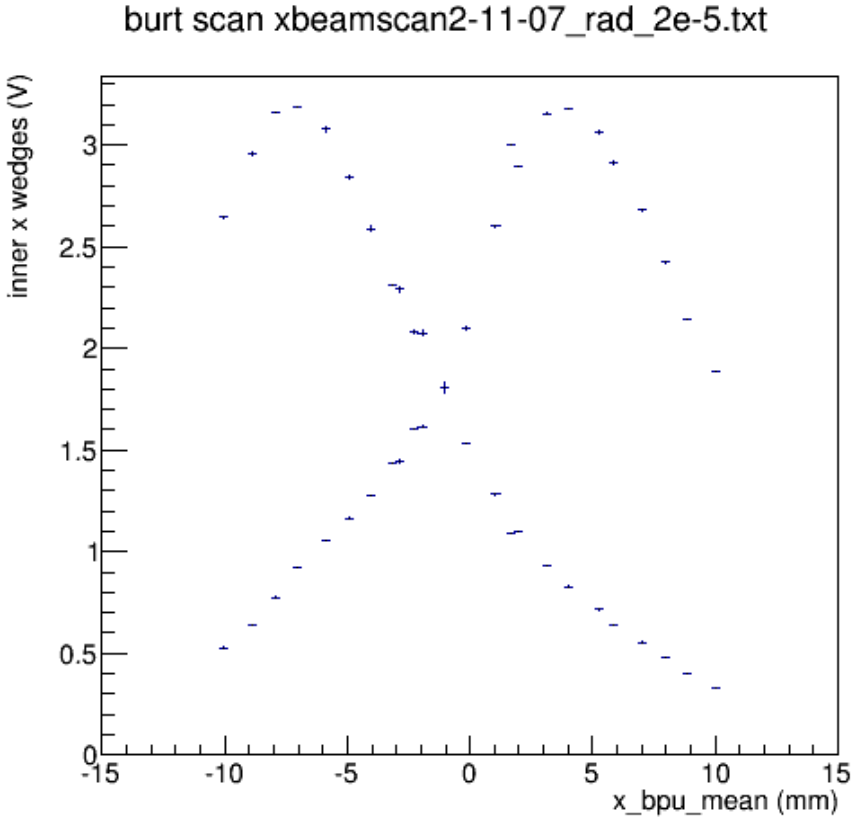
p0	=	**-2.61809**
p1	=	8.37568
p2	=	-1.30637
p3	=	1.47959
p4	=	0.615187
p5	=	31.0245

outer wedges 5-th order poly fit:

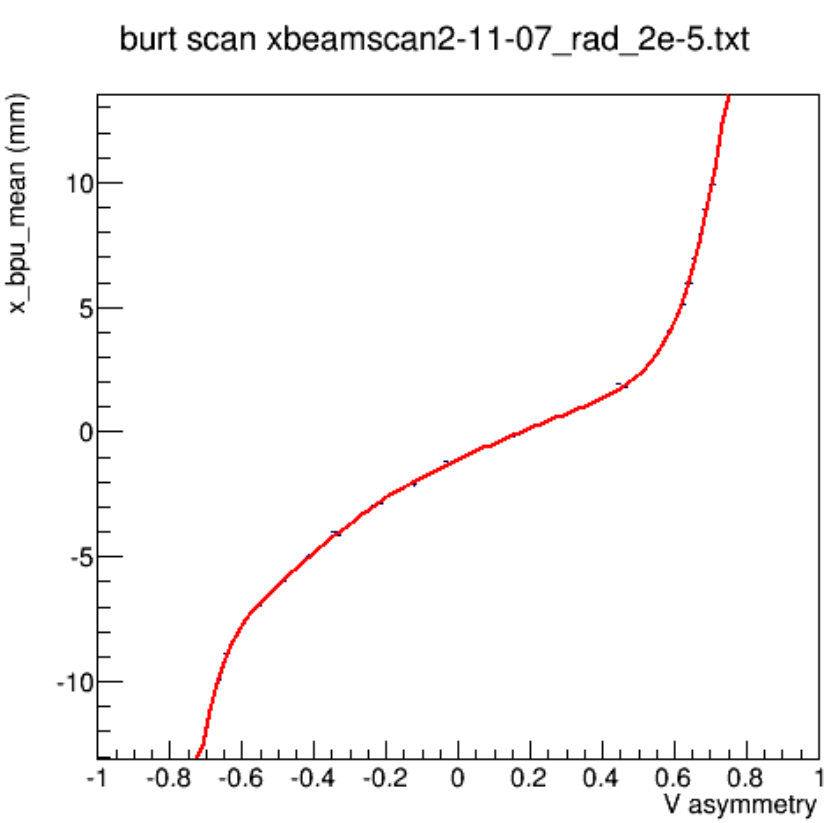
p0	=	**-2.68086**
p1	=	13.9037
p2	=	-0.712466
p3	=	15.3233
p4	=	-0.758043
p5	=	4.94836

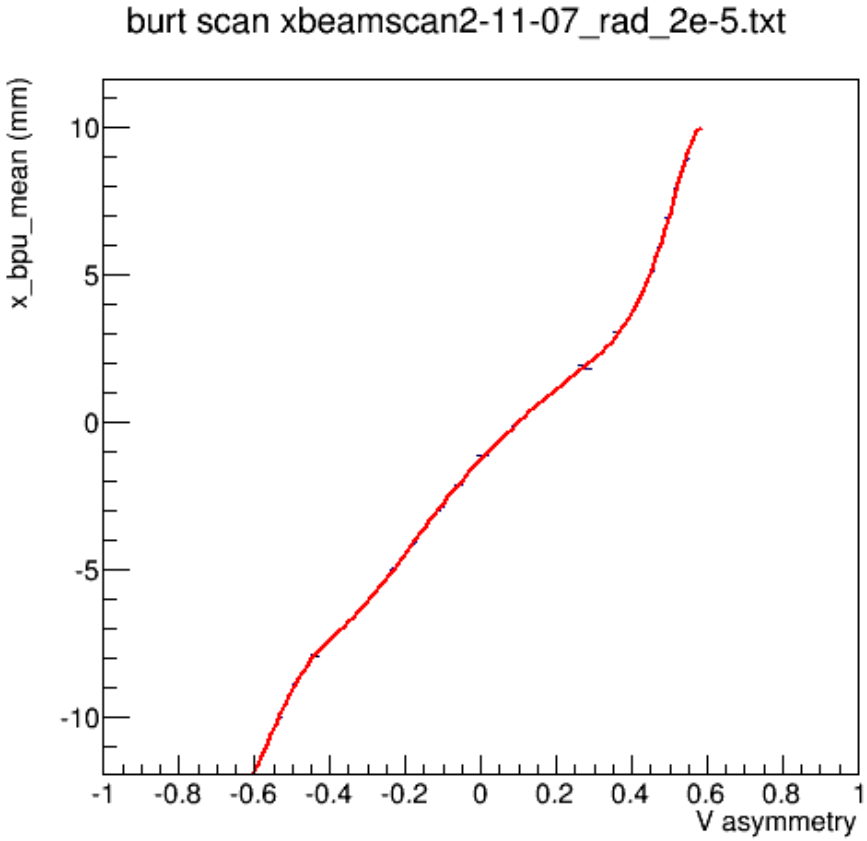
beam scan in x by accelerator controls



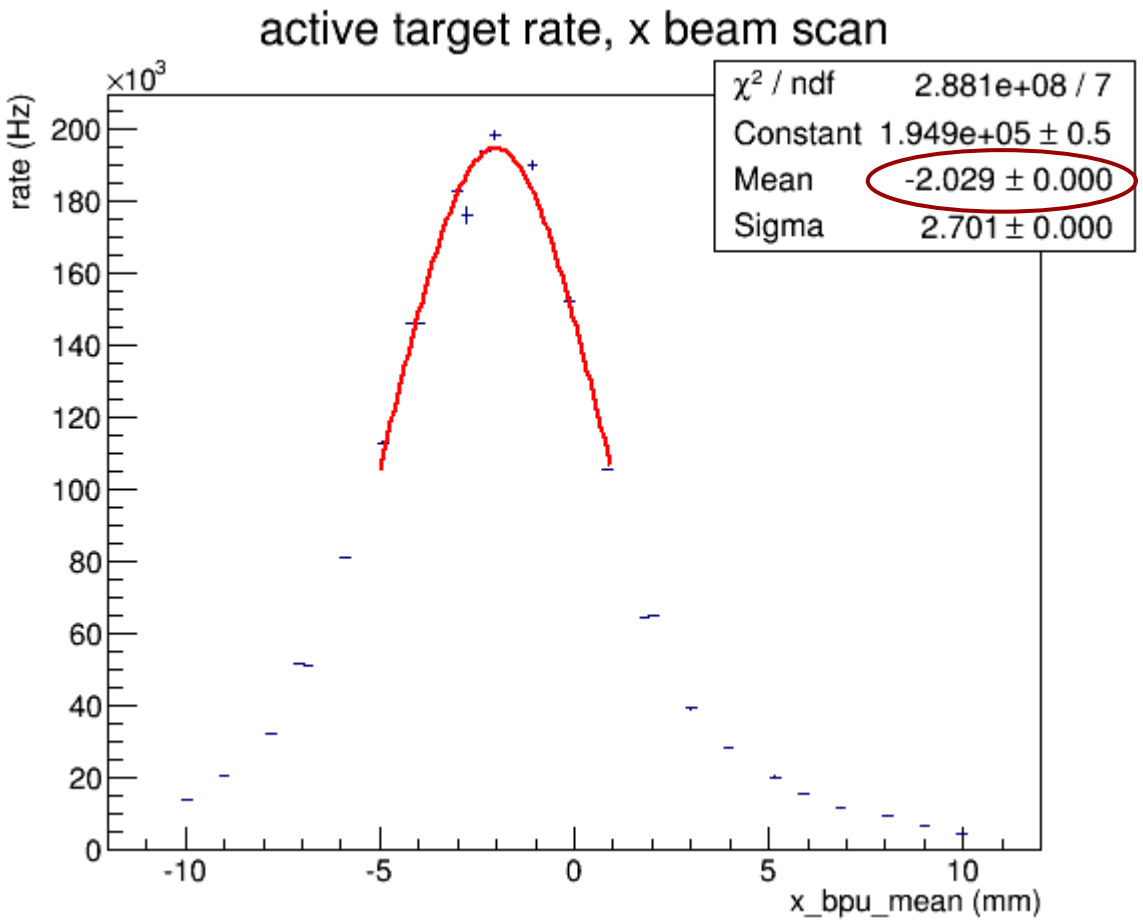


active collimator opposite x-wedge asymmetry





consistency of active collimator response with active target rate



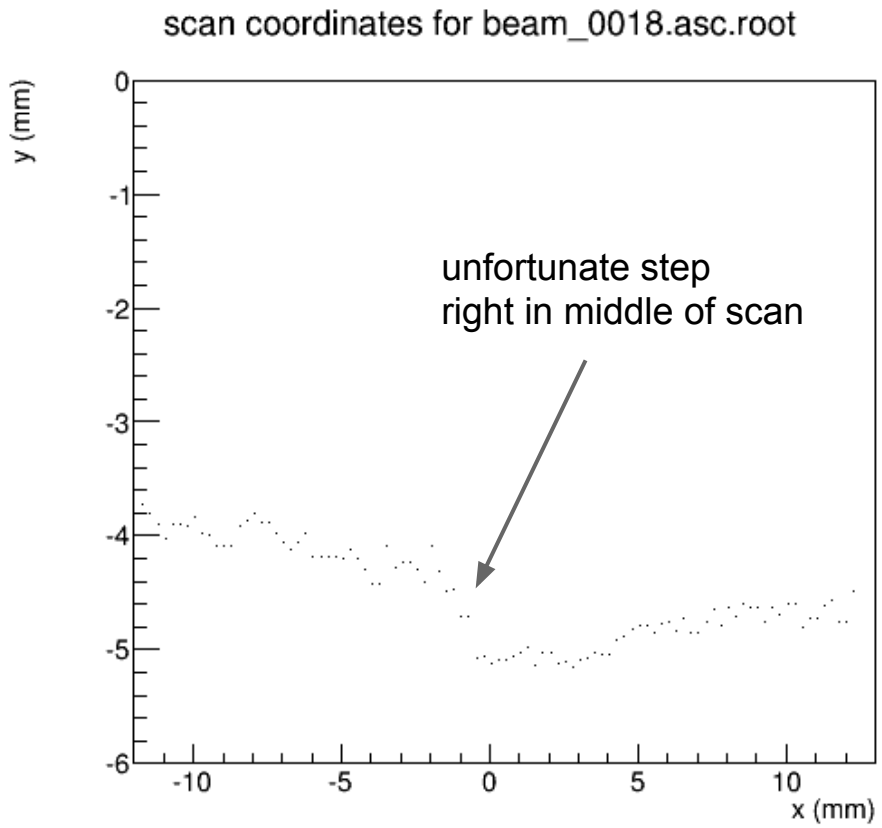
inner wedges 9-th order poly fit:

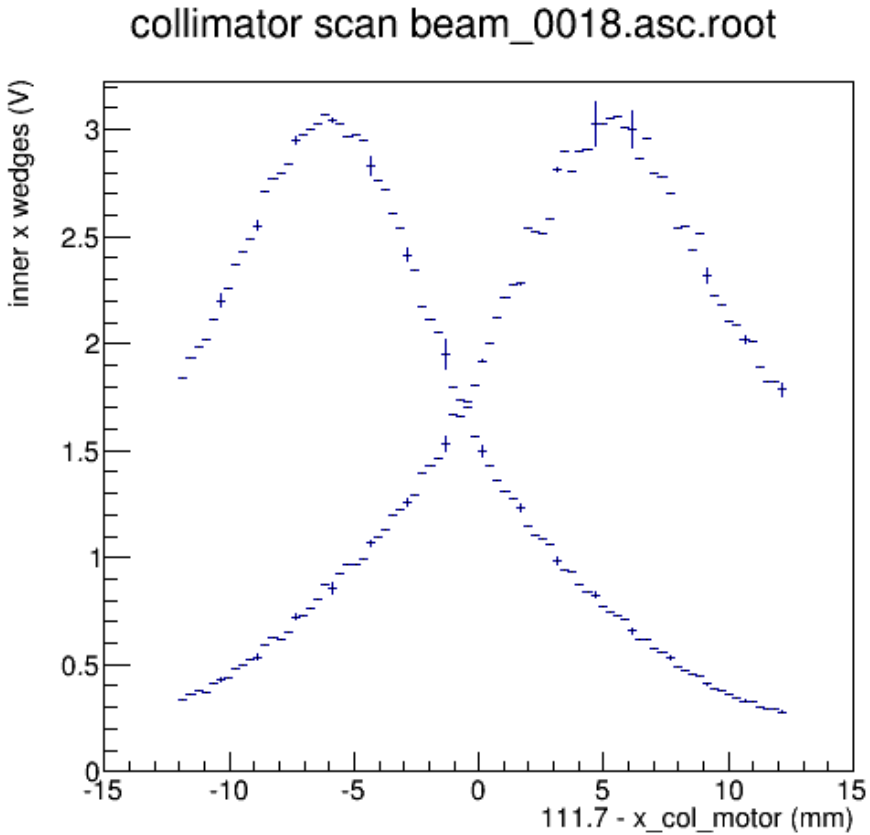
p0	=	**-1.09726**
p1	=	6.69017
p2	=	-2.46311
p3	=	8.26661
p4	=	-26.094
p5	=	-15.0744
p6	=	122.846
p7	=	4.92317
p8	=	-120.196
p9	=	132.999

outer wedges 9-th order poly fit:

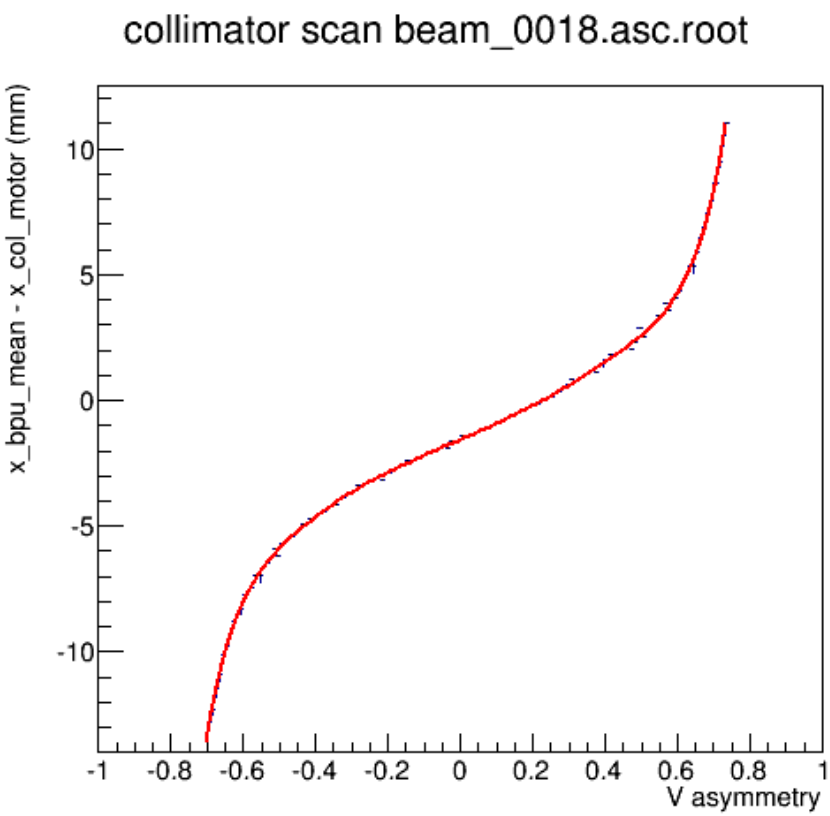
p0	=	**-1.2326**
p1	=	13.4929
p2	=	-11.0958
p3	=	25.7308
p4	=	8.00035
p5	=	-452.947
p6	=	374.782
p7	=	2495.24
p8	=	-848.404
p9	=	-3712.06

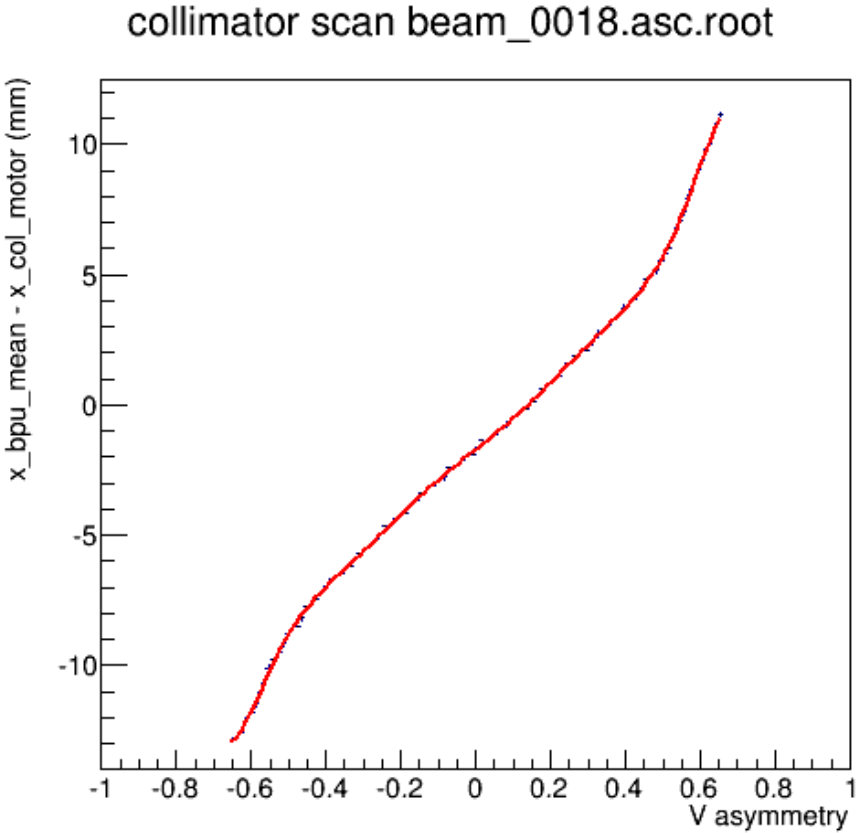
~~beam~~ collimator scan in x by ~~accelerator~~ motor controls





active collimator opposite x-wedge asymmetry





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

active collimator opposite x-wedge asymmetry vs Xbeam-Xcol

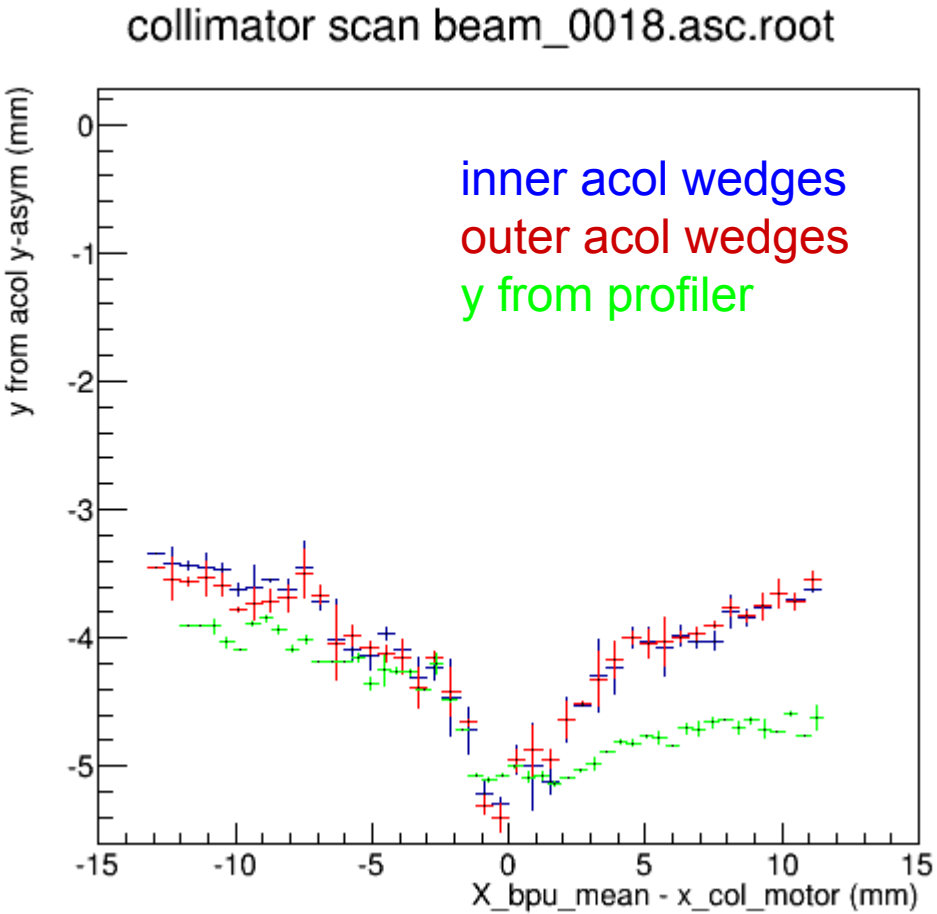
fit: x-wedge asymmetry → x of beam in collimator coordinates

inner x-wedges		
p0	=	**-1.54026**
p1	=	6.30612
p2	=	0.301719
p3	=	8.42805
p4	=	-0.736145
p5	=	10.2121
p6	=	-5.50989
p7	=	-97.3332
p8	=	-4.79739
p9	=	243.495

outer x-wedges		
p0	=	**-1.6961**
p1	=	11.3452
p2	=	0.632244
p3	=	46.9961
p4	=	-2.63319
p5	=	-423.482
p6	=	7.26192
p7	=	1595.65
p8	=	10.9569
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



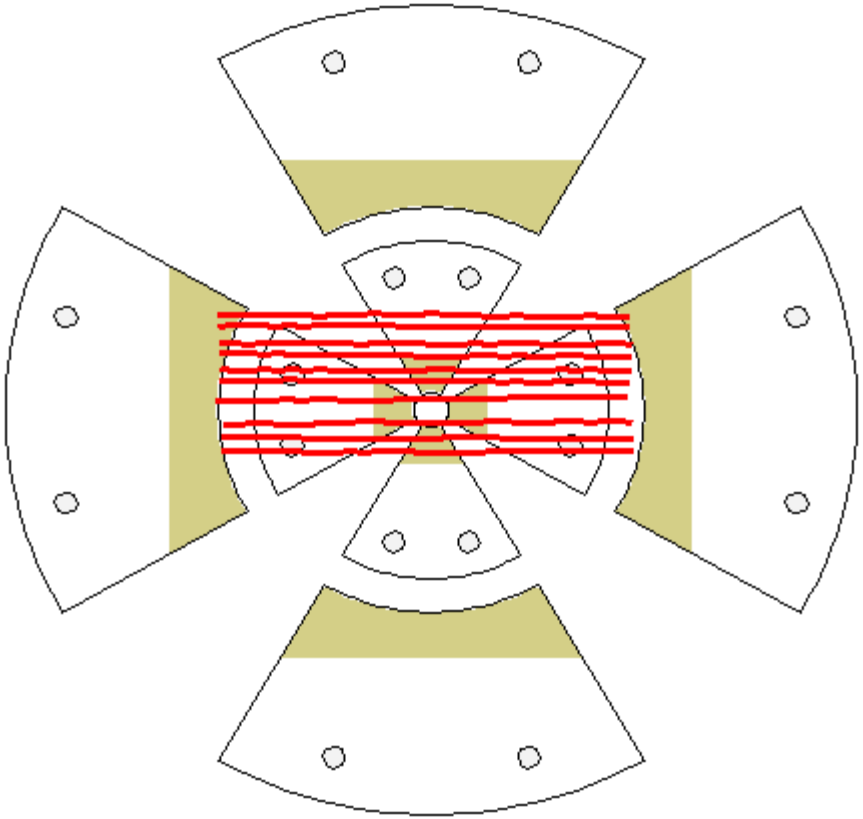
2D calibration is needed

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?

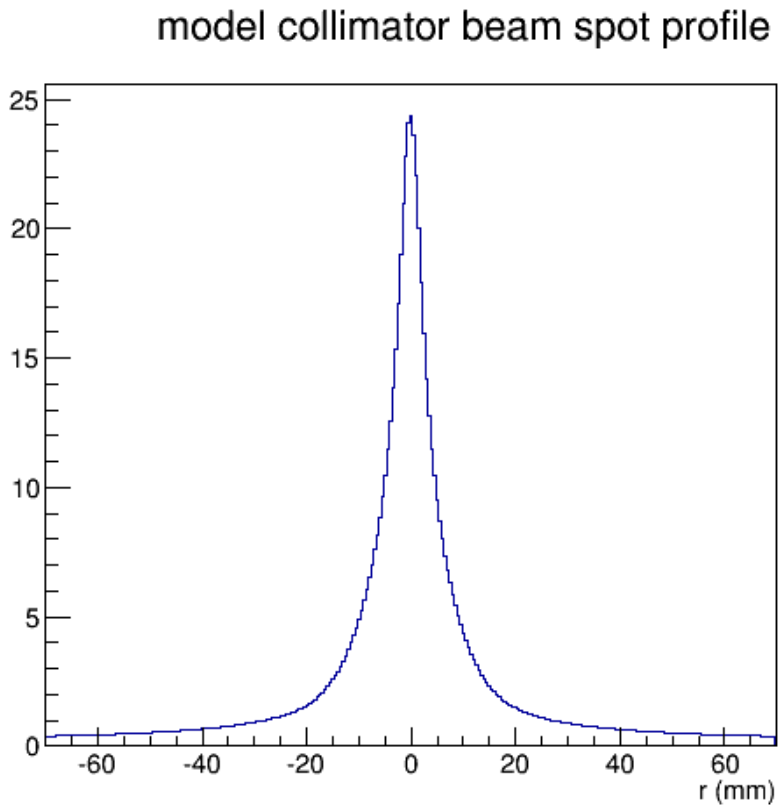
1. active collimator is tilted?
2. beam ellipse is tilted?
3. profiler is sensitive to beam components (eg. X-rays) not seen by active collimator?

new calibration scan, performed after profiler was removed



- limited y-range was achieved
- easier to raise than to lower
- total x motion range ~58mm
- beam current was relatively stable

fit to data allows extraction of photon beam spot profile



start with MC shape

convolute with virtual electron beam spot

central peak about the right width

significant flux in the tails

model tails as a power law

initial calibration gives wedge asymmetries