Beam check

Jie Liu

05/11/2016

Current Summary

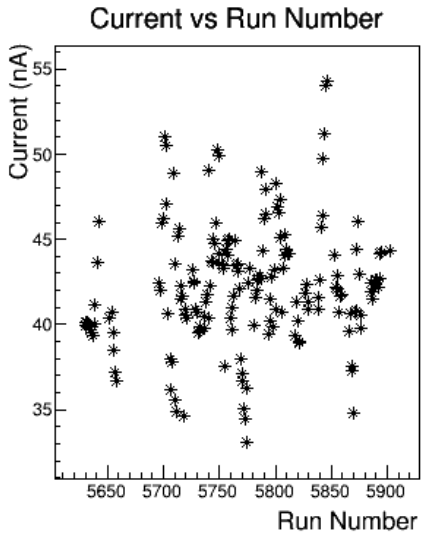
This tables shows the percentage of runs the in the current range for each energy setting

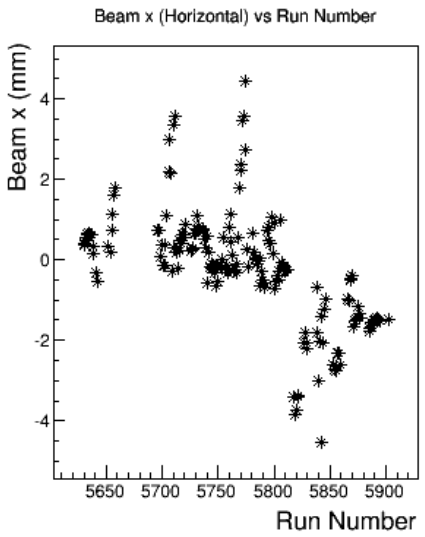
current	0~20nA	20~30nA	30~40nA	40~45nA	45~50nA	50~60nA	60~70nA	70~80nA	80~90nA	90~100nA	100~110nA
2.2GeV 2.5T	0	2.2	47.1	37.0	12.3	1.4	0	0	0	0	0
1.7GeV 2.5T, Tran	0	0	23.5	57.1	13.8	3.2	2.3	0	0	0	0
1.7GeV 2.5T, Tran	0	0	5.3	69.4	25.3	0	0	0	0	0	0
2.2GeV 5T, Long	0	0	22.2	59.1	15.3	3.4	0	0	0	0	0
2.2GeV 5T, Tran	0	0	6.7	33.3	4.4	44.4	11.1	0	0	0	0
3.3GeV	0	0	3.8	22.6	17.0	15.1	22.6	7.6	1.9	9.4	0
total	0	0.3	18.9	55.4	17.4	4.6	2.4	0.4	0.1	0.5	0

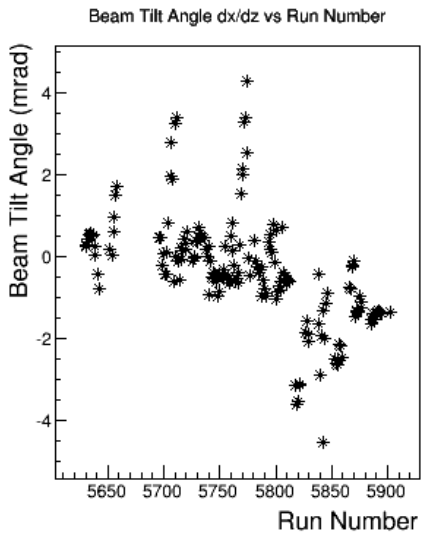
~90% of data took with current <50nA, ~74% of data with current <45nA,~19% of data with current <40nA

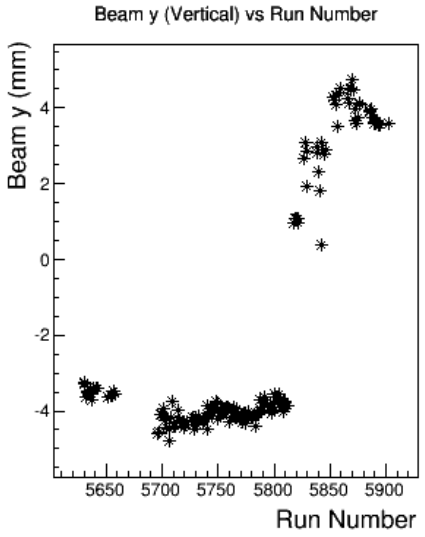
Beam Energy 2254 GeV

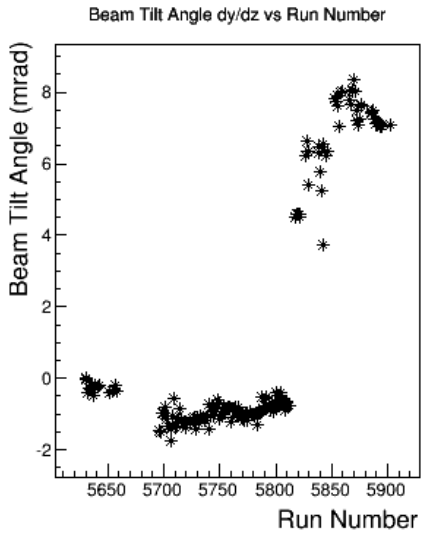
-- beam information versus Run Number









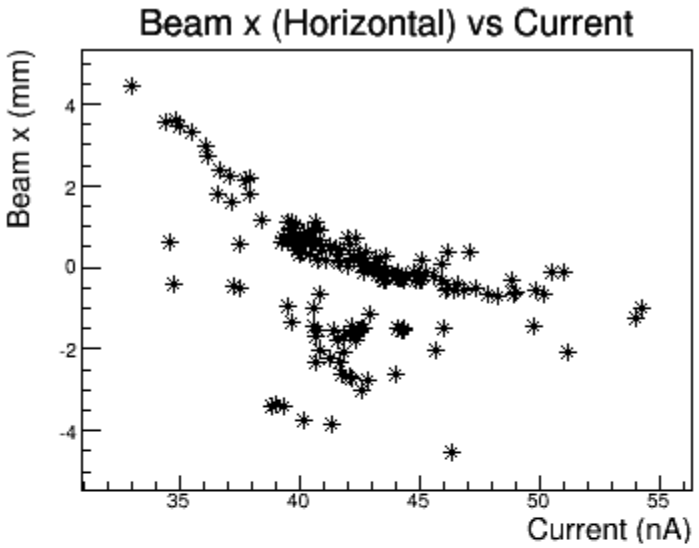


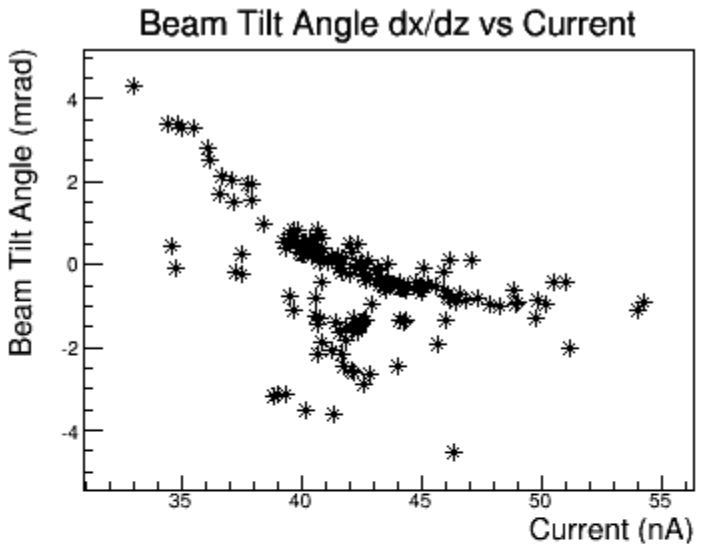
Two issues to check

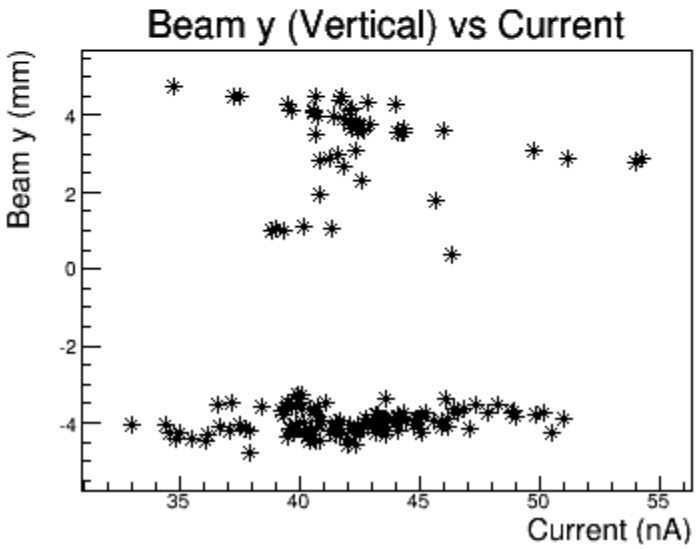
- Current dependence
- Suddenly jumps

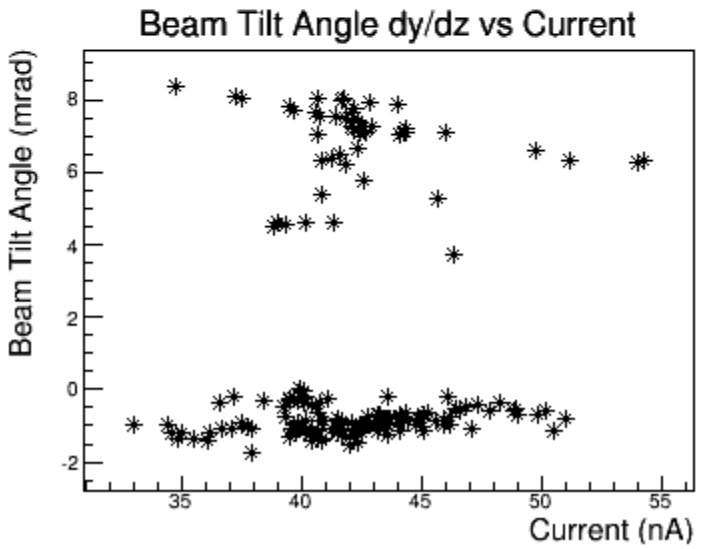
Beam Energy 2254 GeV

-- beam information versus Current









Two issues to check

- Current dependence
- Suddenly jumps

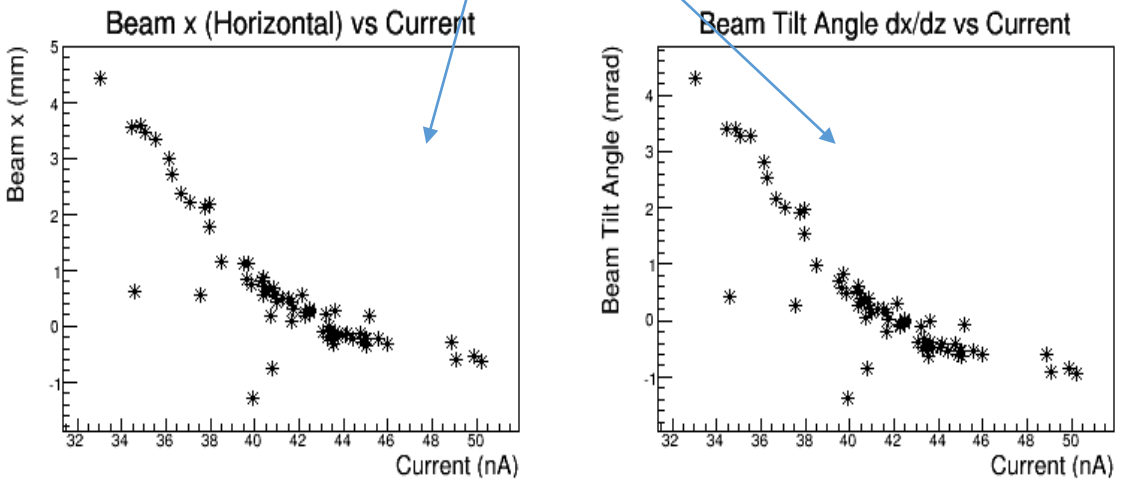
Ebeam=2.2GeV, momentum 2.049GeV, Longitudinal 5T – best situation

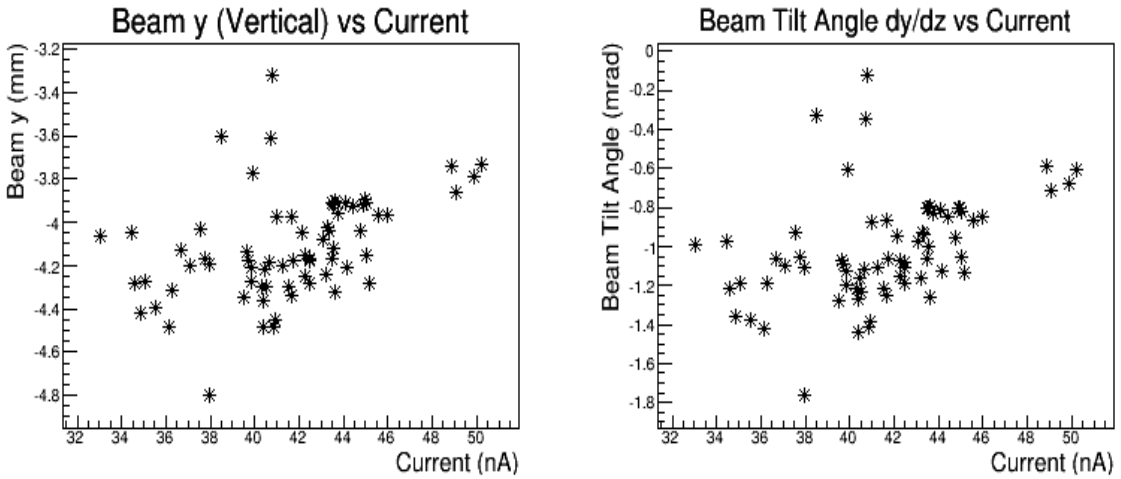
These two plots shows the comparison between pengjia's updated database and old database result

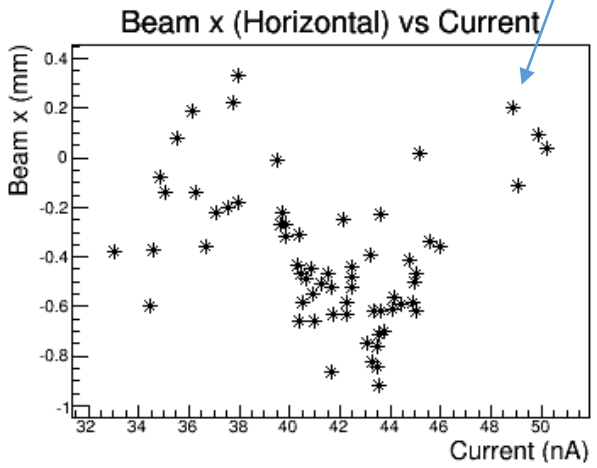
Each mark stands for one run in the plot

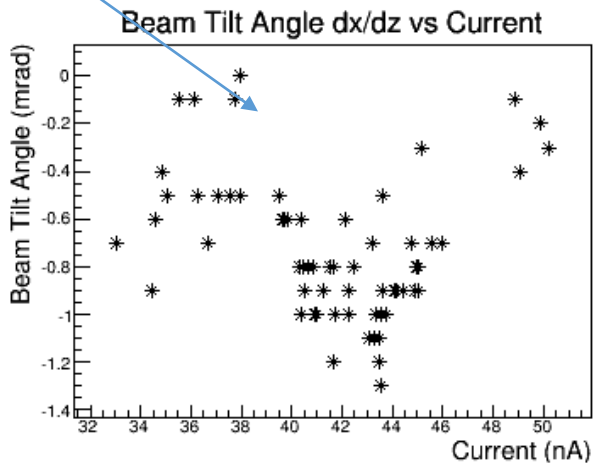
Using the old database

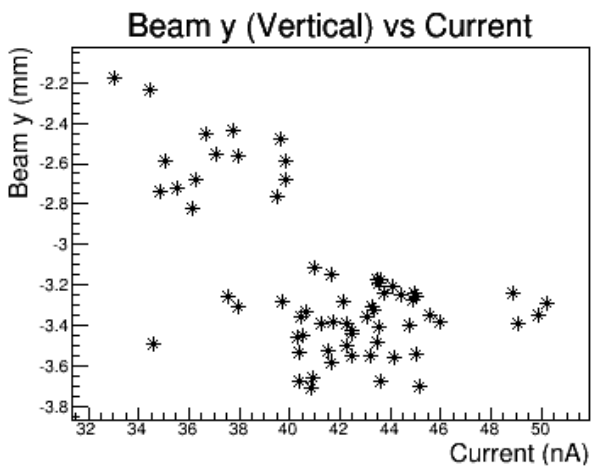
Using the new database

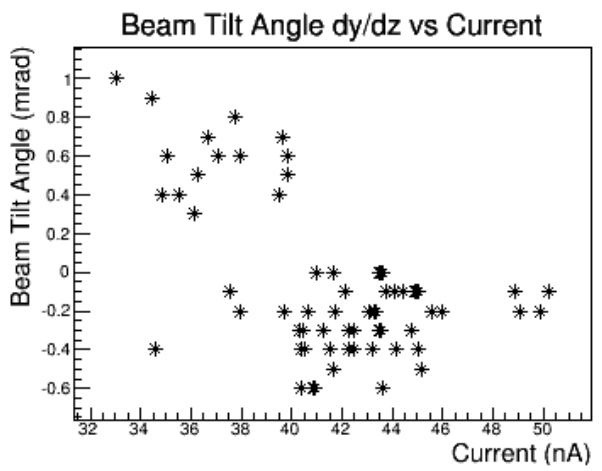








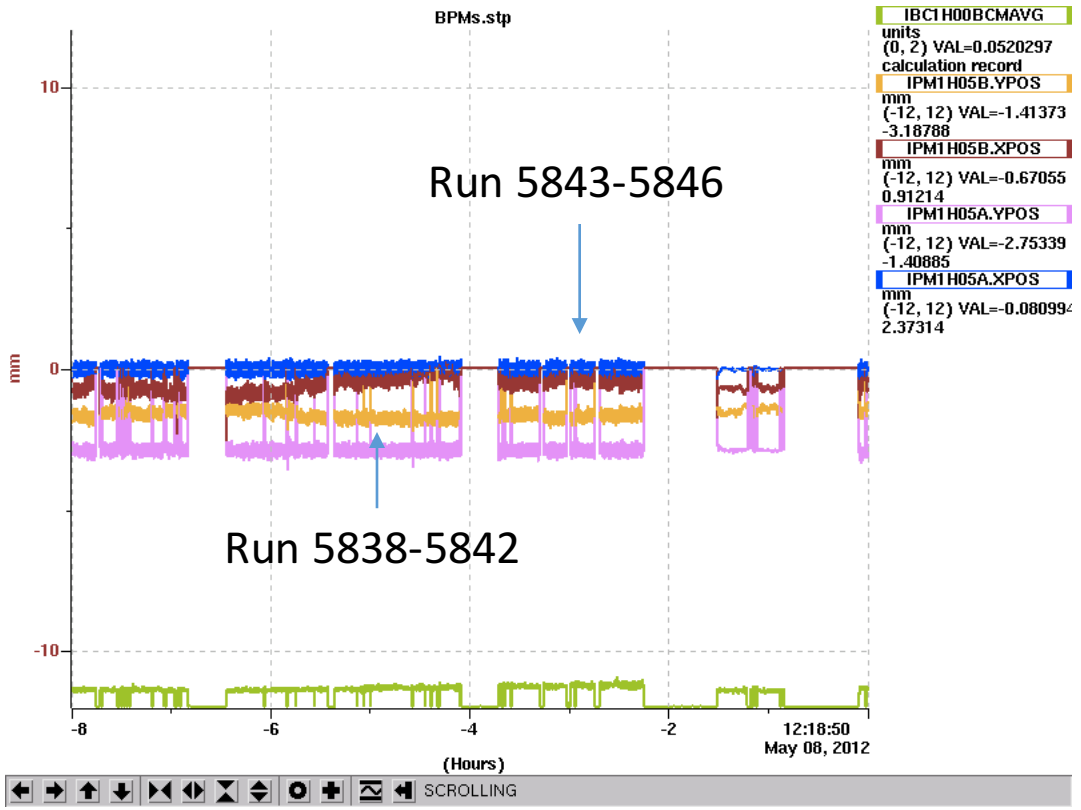




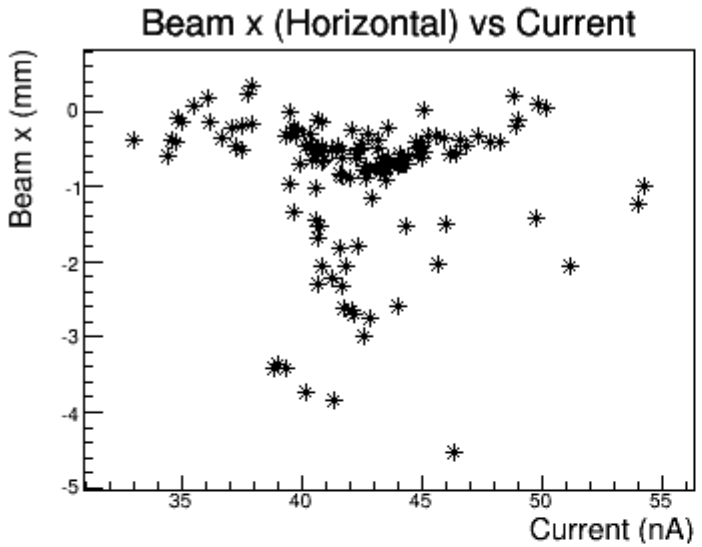
Ebeam=2.2GeV, momentum 1.469GeV, Longitudinal 5T – best situation

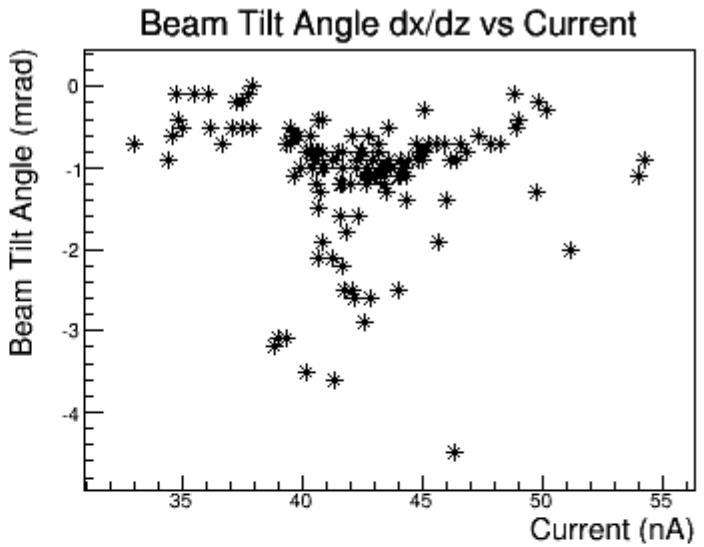
- Yields shows almost no change from run 5842 to 5843 and online information also shows the same, but calibrated beam position jumps
- BPMA just drift 0.02mm in x, the calibrated horizontal x should not jump from -4.54mm to -1.43mm from run 5842 to 5843
- pedestal changed

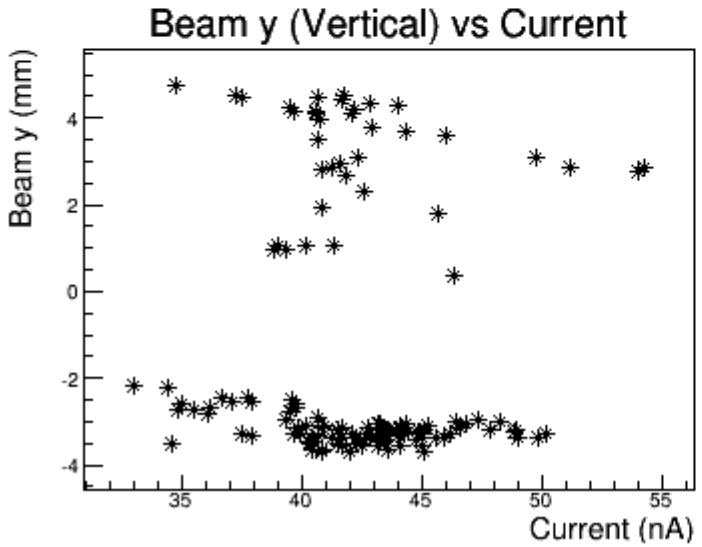
						old database	old database	old database	old database
run	Momentum	current/nA	yield(use 6mm Raster cut)	BPMA X (mm)	BPMA Y (mm)	Horizontal tg_x (mm)	tg_phi =dx/dz (mrad)	Vertical tg_y (mm)	tg_theta =dy/dz (mrad)
5838	1.4684	40.88	1	-1.85	-2.03	-0.67	-0.42	2.8	6.31
5839	1.4684	41.61	0.992	-1.82	-2.04	-1.81	-1.63	2.97	6.48
5840	1.4684	42.59	0.993	-1.82	-2.03	-3	-2.87	2.32	5.78
5841	1.4684	45.7	0.977	-1.78	-2.06	-2.02	-1.9	1.8	5.24
5842	1.4684	46.39	0.973	-1.78	-2.06	-4.54	-4.54	0.37	3.74
5843	1.4684	49.78	0.966	-1.76	-2.06	-1.43	-1.3	3.09	6.57
5844	1.4684	51.21	0.969	-1.73	-2.07	-2.07	-2	2.88	6.34
5845	1.4684	54.02	0.969	-1.73	-2.08	-1.23	-1.12	2.79	6.25
5846	1.4684	54.27	0.985	-1.71	-2.09	-0.99	-0.89	2.88	6.33
5850	1.4684	45.98	0.973	-1.79	-2.05	-1.71	-1.56	3.37	6.87
5851	1.4684	43.05	0.983	-1.8	-2.02	-1.85	-1.68	3.91	7.42

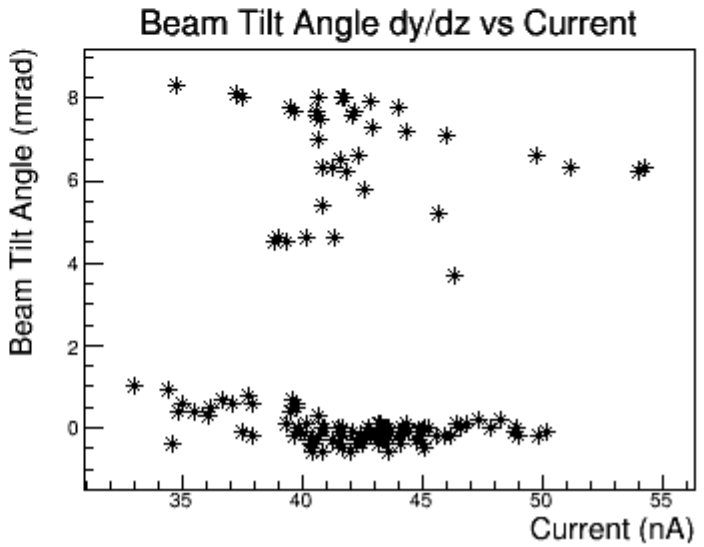


Beam Energy 2254 GeV – New database









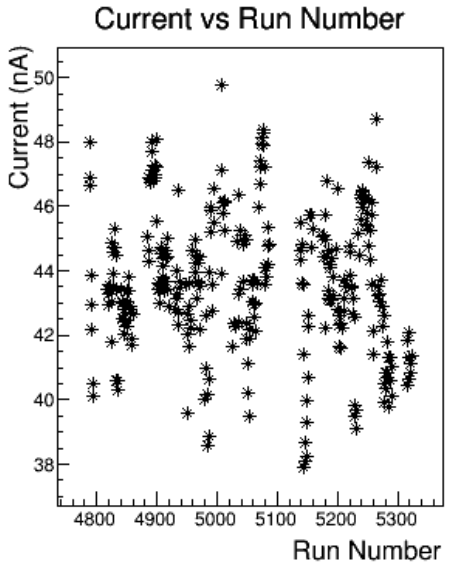
Run 5706-5877

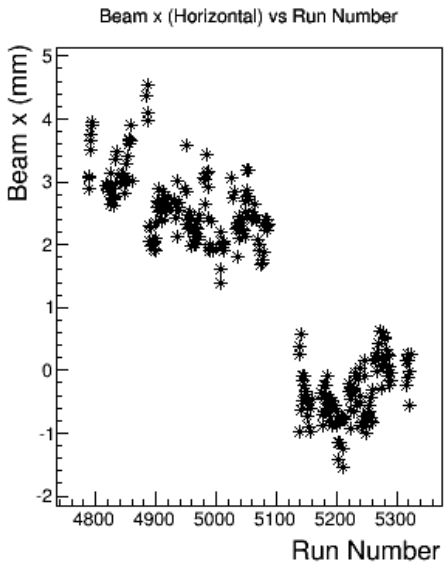
Summary

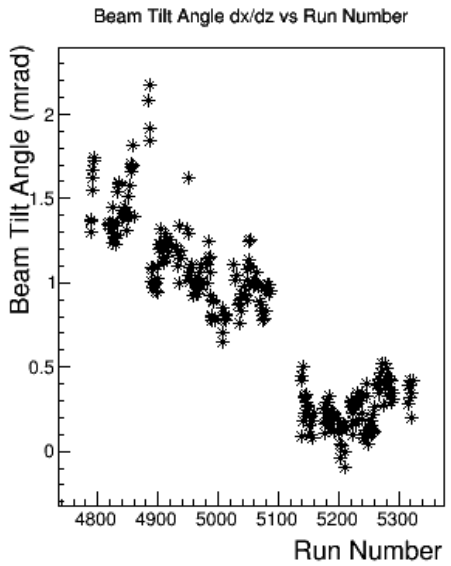
- 2.2GeV, longitudinal setting, we are going to fix the current dependence, but still jumps exists? pedestal jumps, average more runs/long time?
- 1.1, 1.7 GeV, have clear current dependence and need/can fix. And each of them have several bands.
- 2.2GeV, 2.5T transverse, seems not has clear current dependence, but have big deviations between bands. Need A way to fix the huge jumps, pedestal jumps, average more runs/long time?
- 2.2GeV, 3.3GeV seems not too bad, within uncertainty?

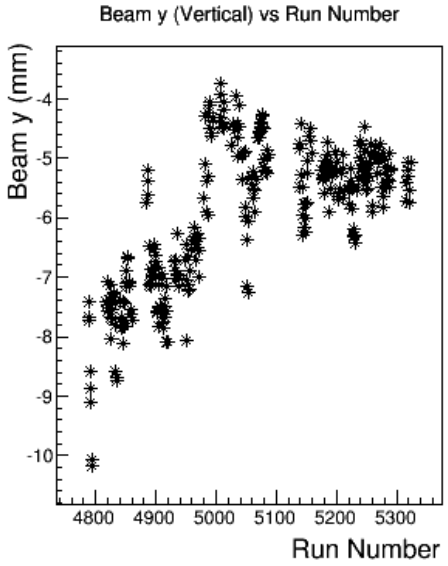
Beam Energy 1157 GeV

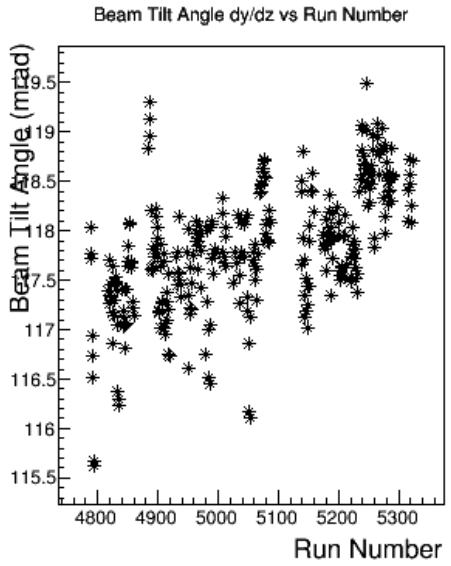
-- beam information versus Run Number





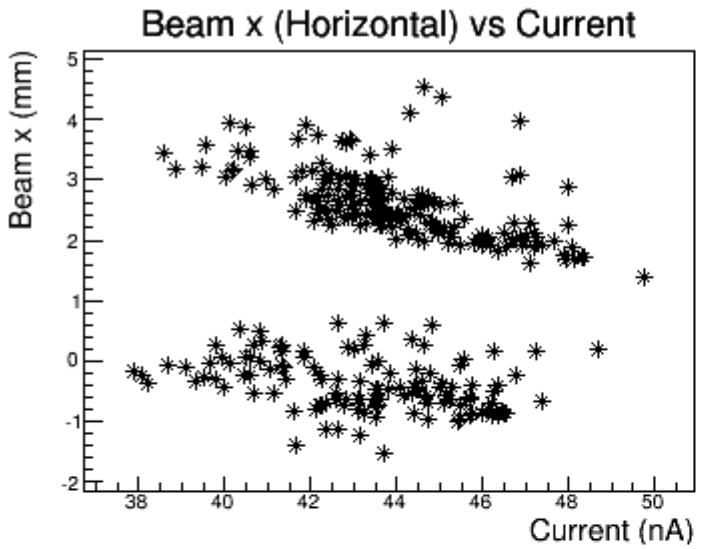


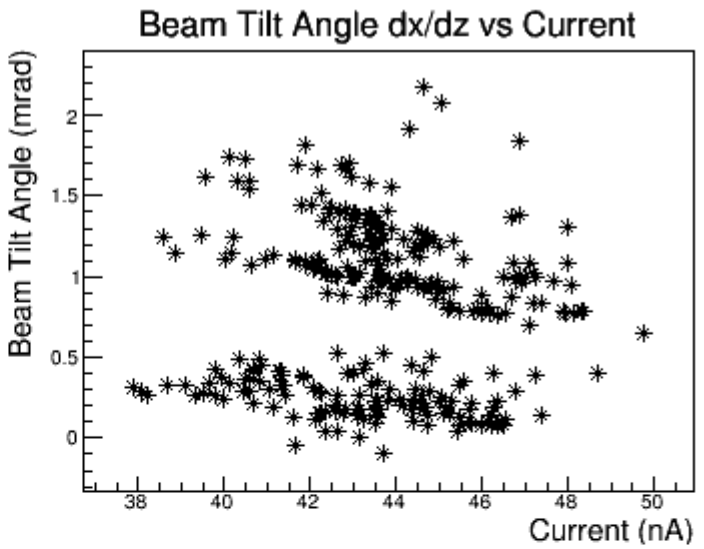


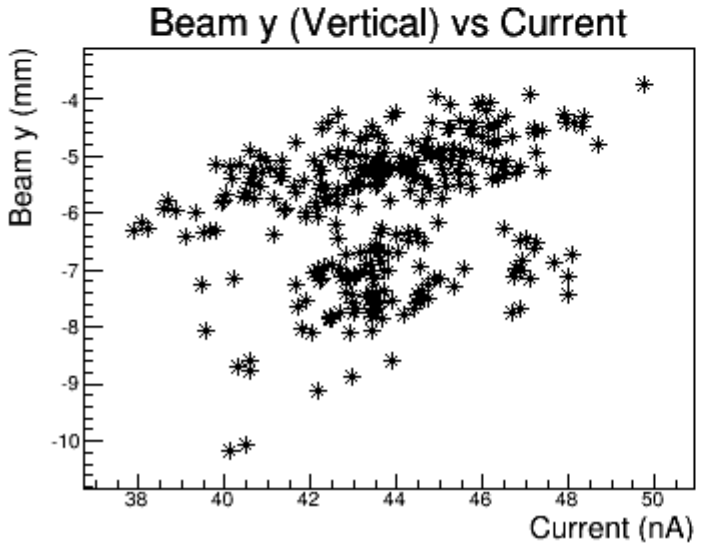


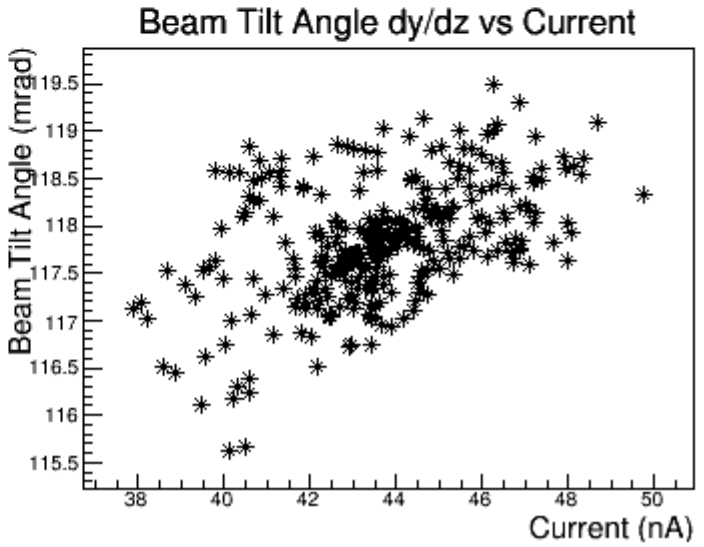
Beam Energy 1157 GeV

-- beam information versus Current









Two bands:

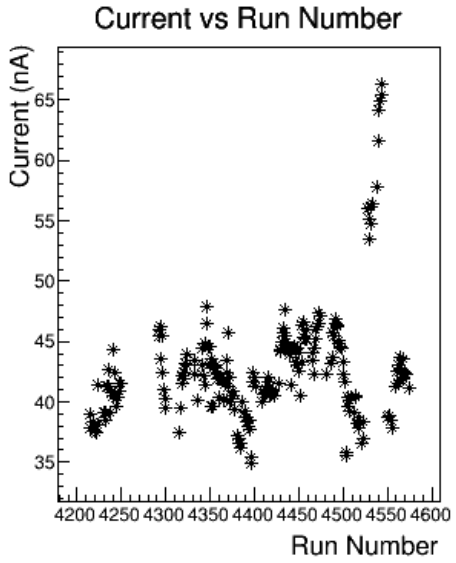
Real position shift
Between bands?

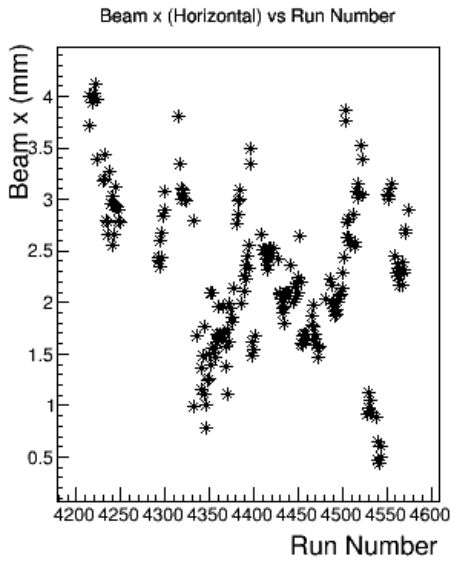
Both bands have
Strong current correlation

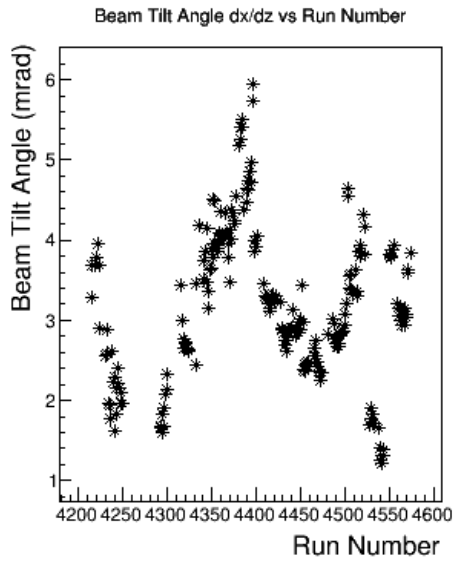
Two bands have different
Slope for x, dx/dz

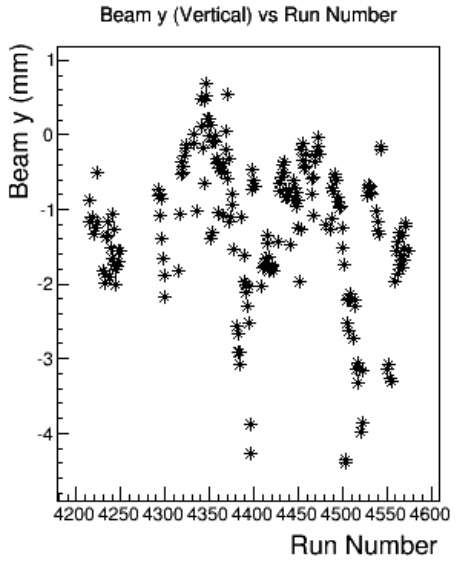
Beam Energy 1711 GeV

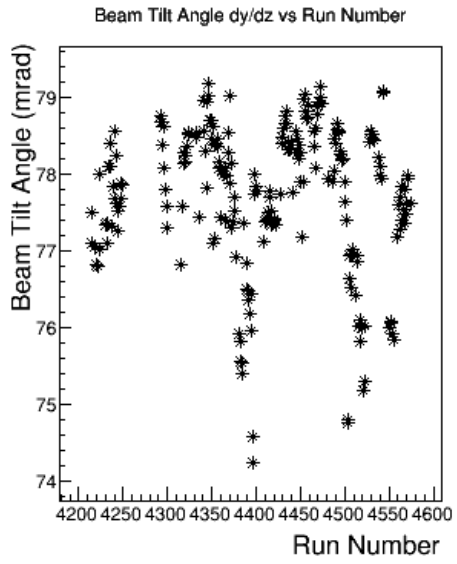
-- beam information versus Run Number





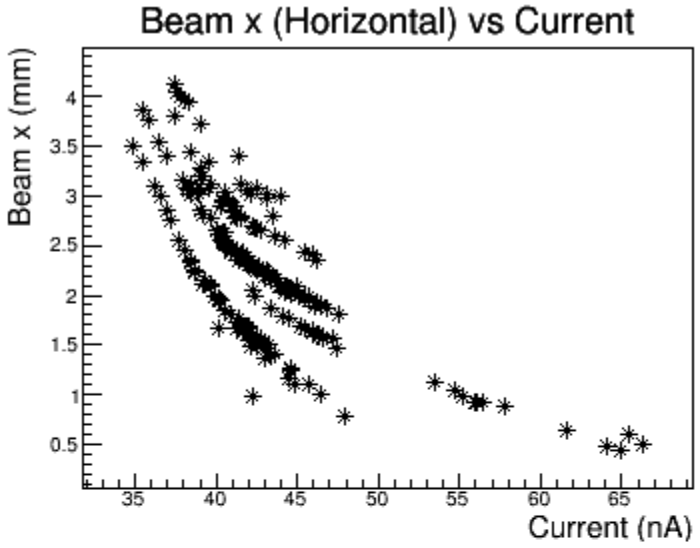


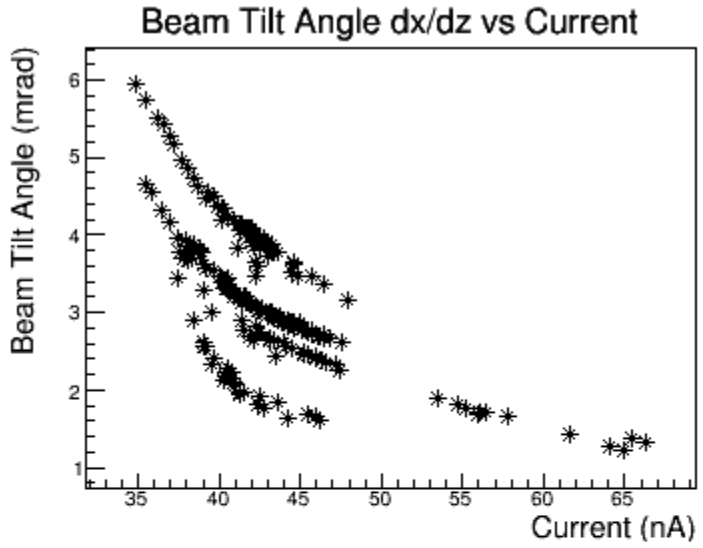


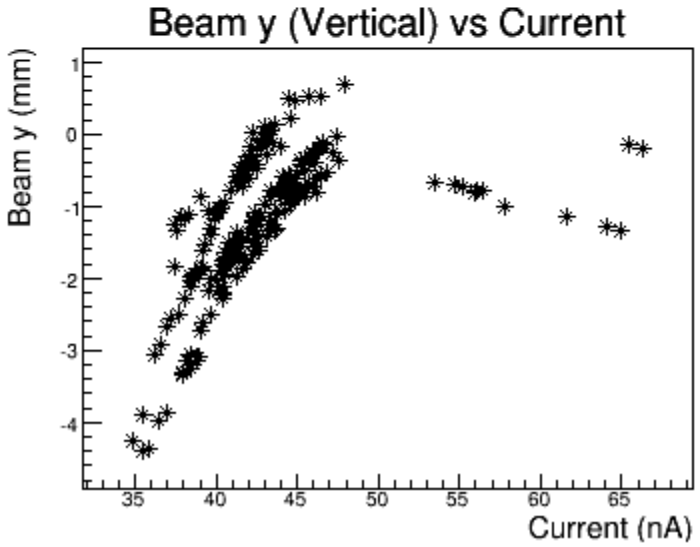


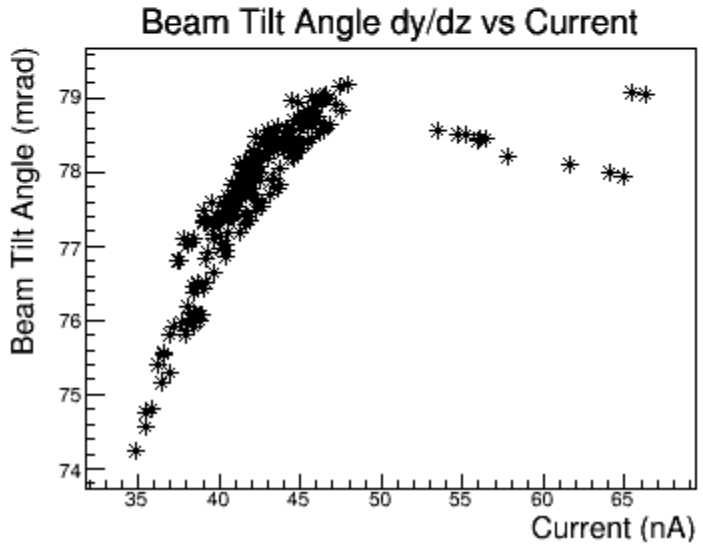
Beam Energy 1711 GeV

-- beam information versus Current









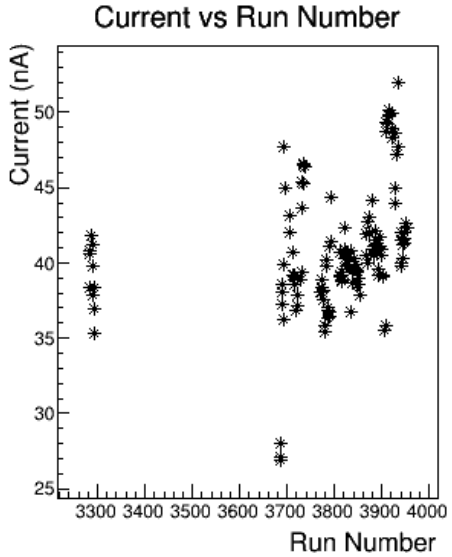
Several bands:

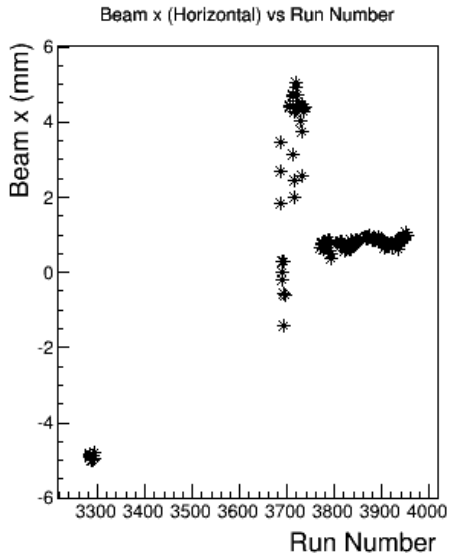
Real position shift
Between bands?

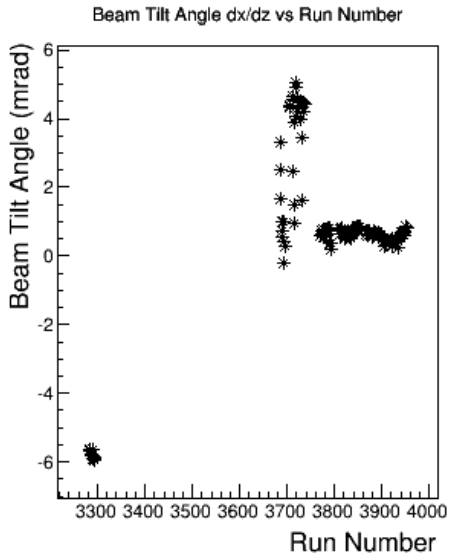
All bands shows
Strong current
dependence

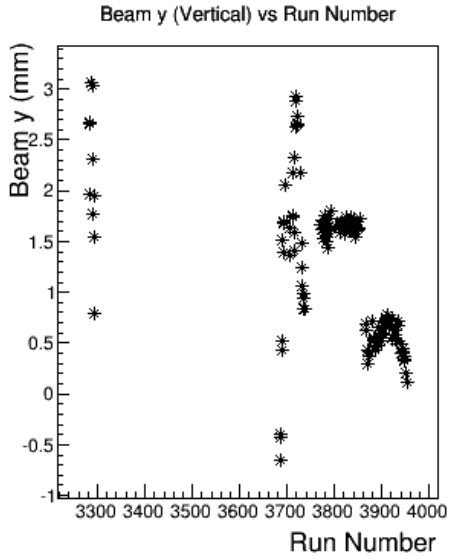
Beam Energy 2253 GeV

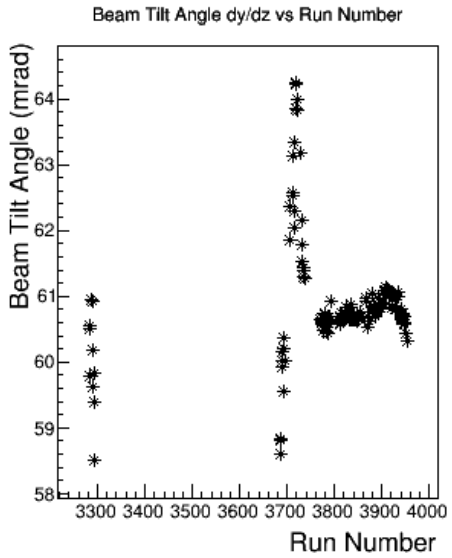
-- beam information versus Run Number





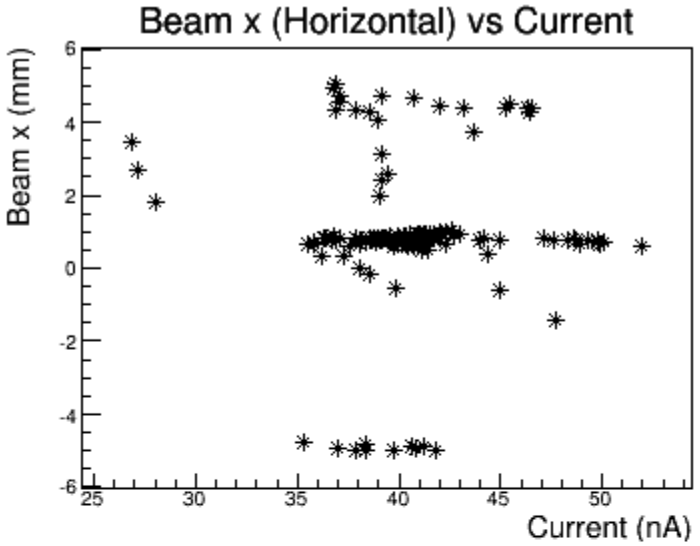


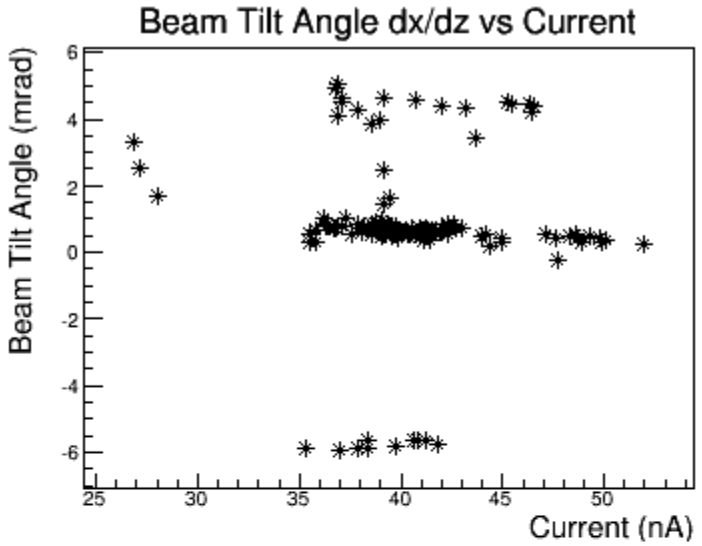


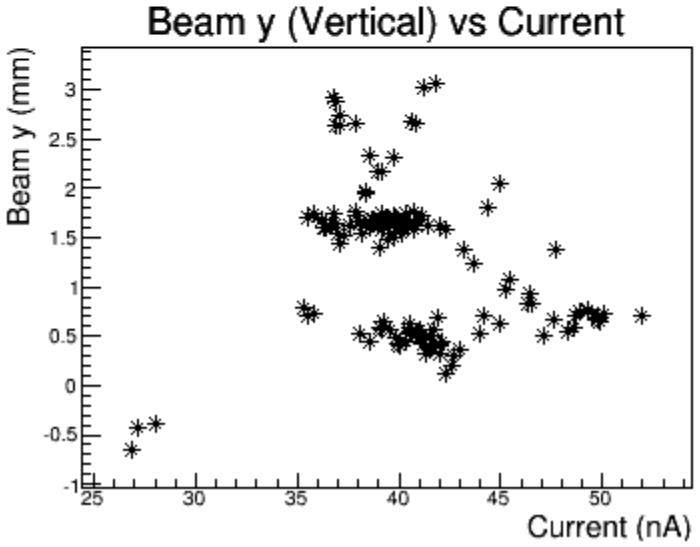


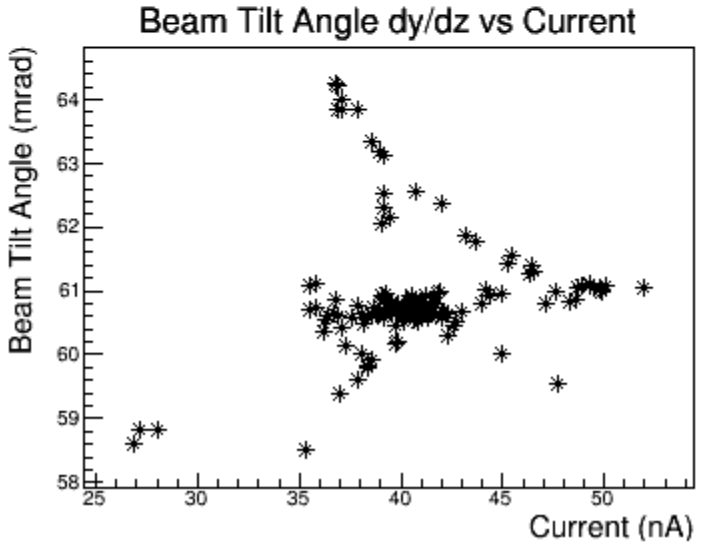
Beam Energy 2253 GeV

-- beam information versus Current









Several bands:

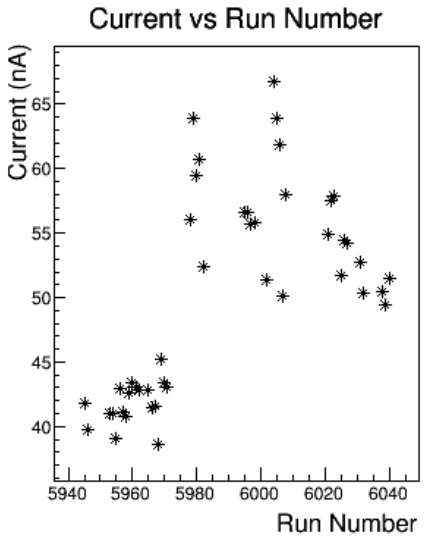
Real position shift
Between bands?

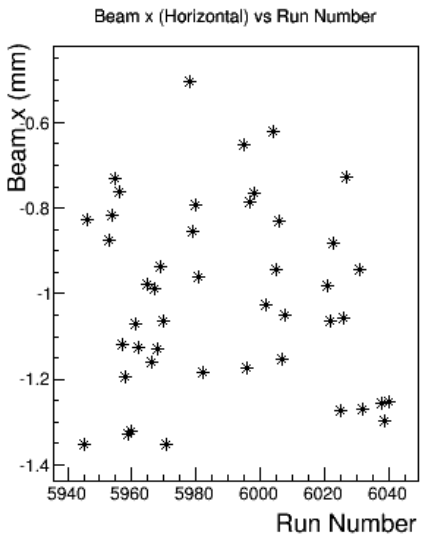
No much current dependence?

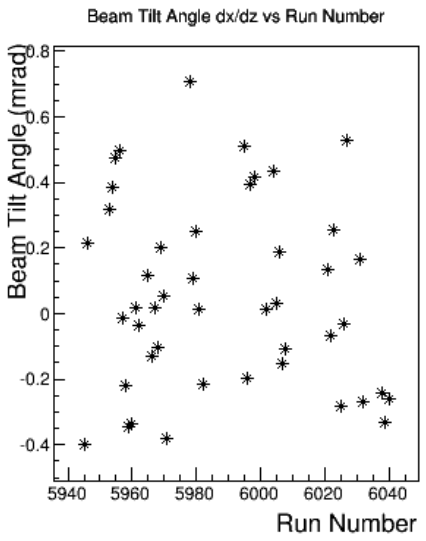
Need fix the beam jumps

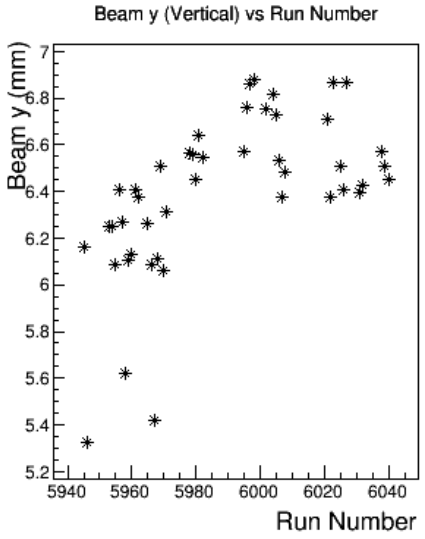
Beam Energy 2255 GeV

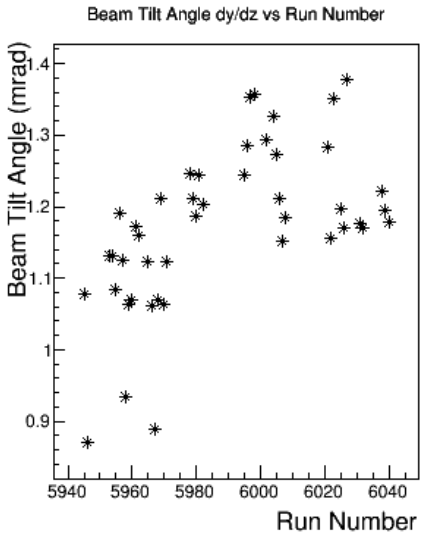
-- beam information versus Run Number





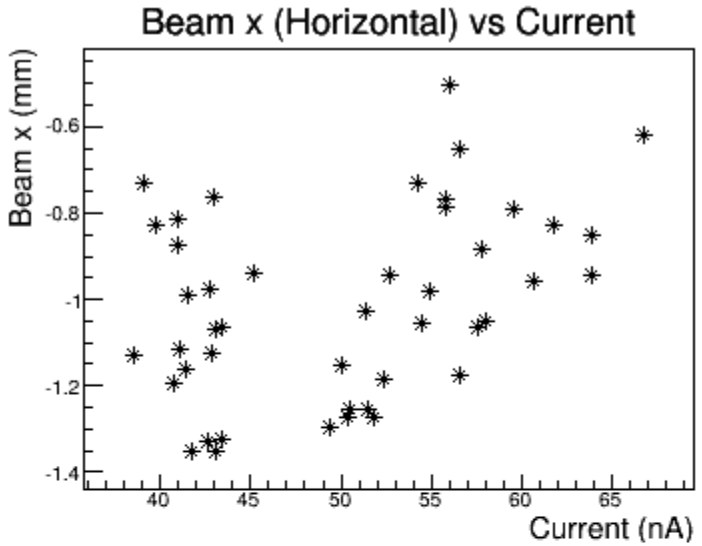


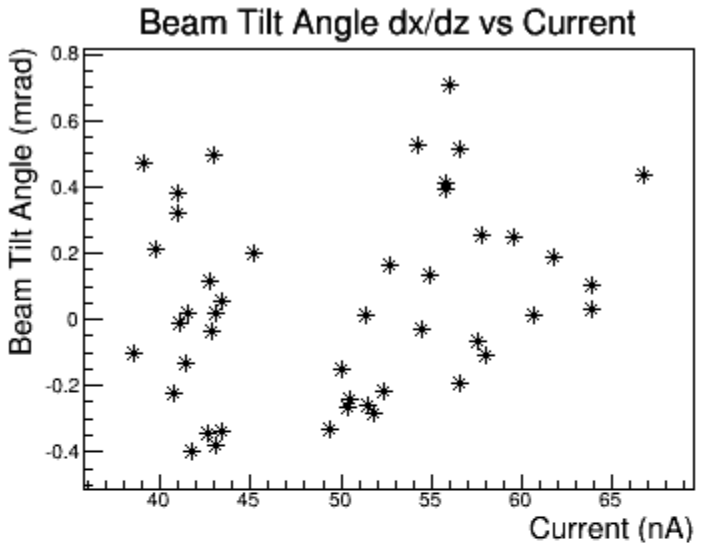


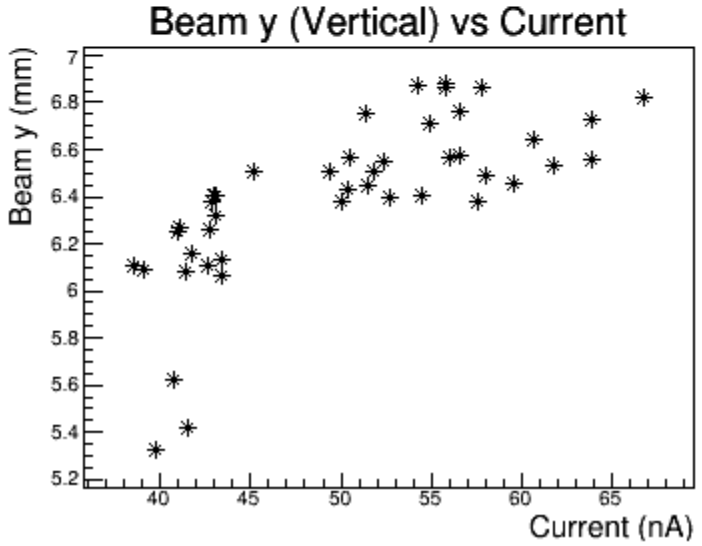


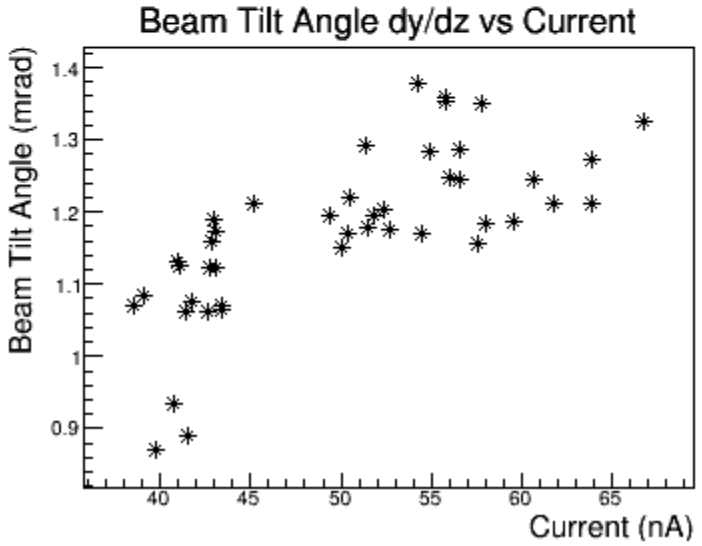
Beam Energy 2255 GeV

-- beam information versus Current





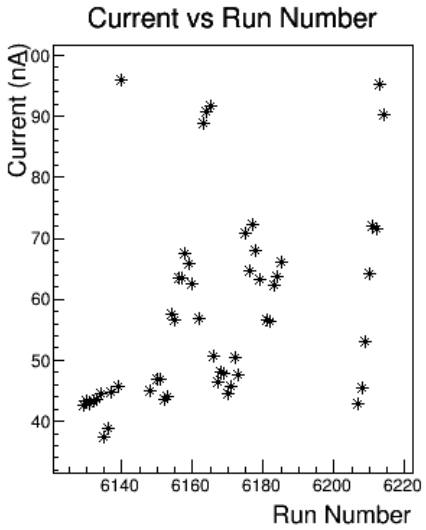


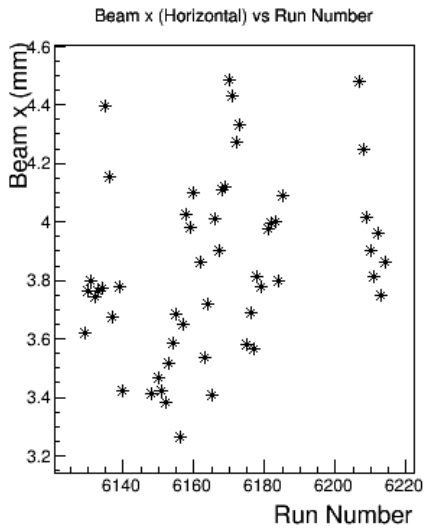


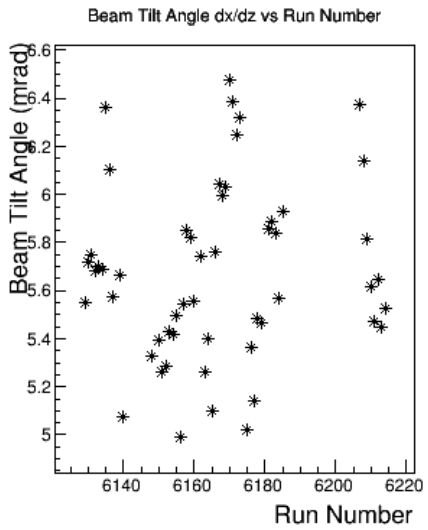
weak current dependence
For y, dy/dz

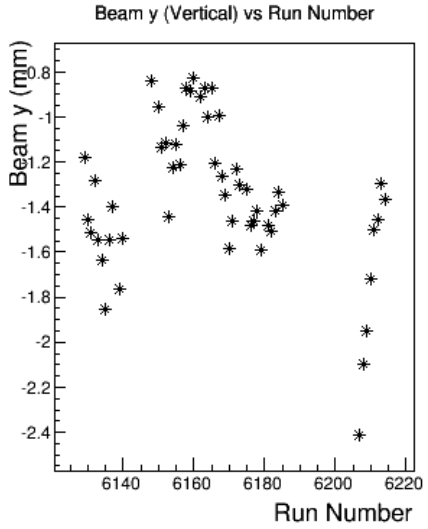
Beam Energy 3351 GeV

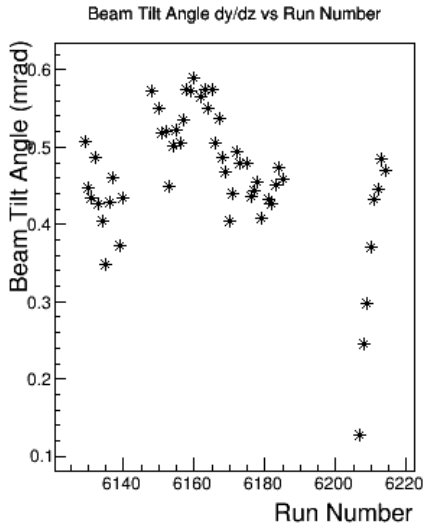
-- beam information versus Run Number





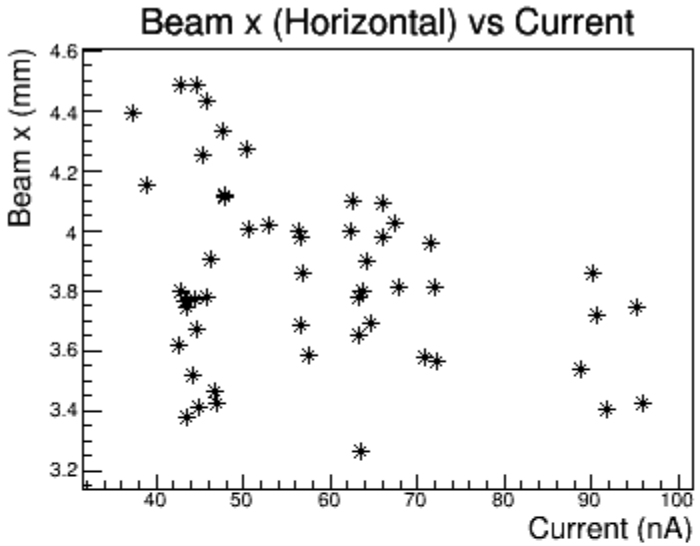


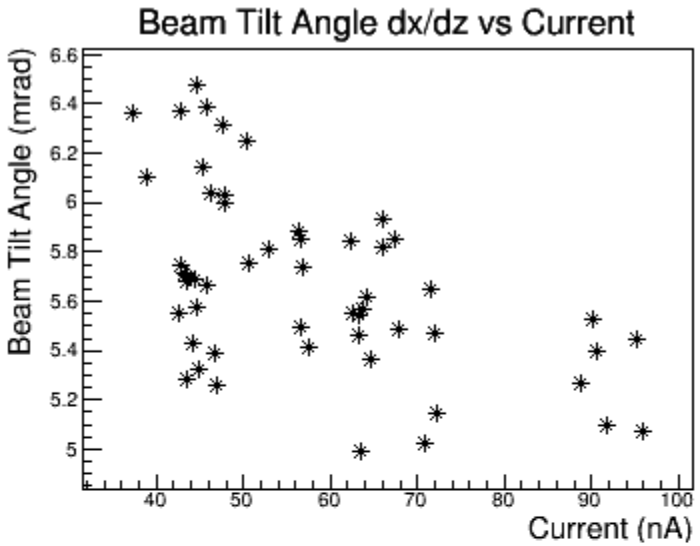


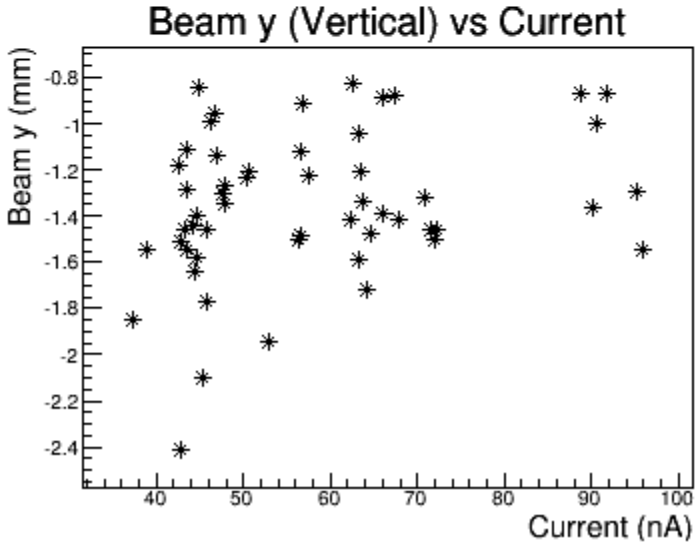


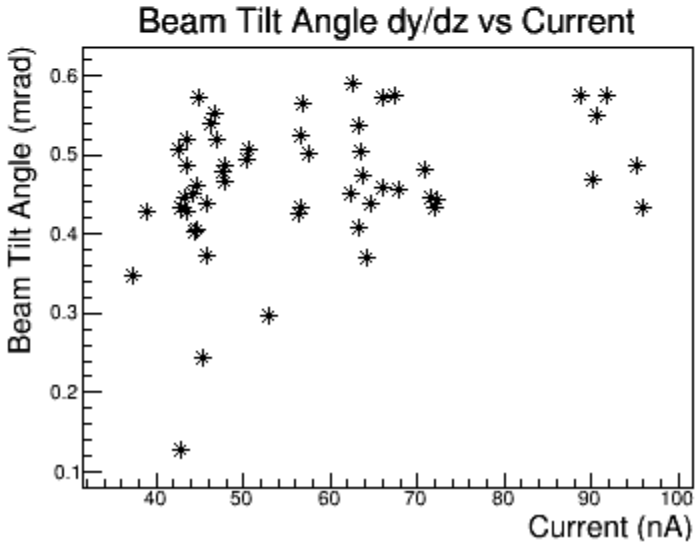
Beam Energy 3351 GeV

-- beam information versus Current









weak current dependence