

# Analysis update

acceptance & yields

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10/14/2015

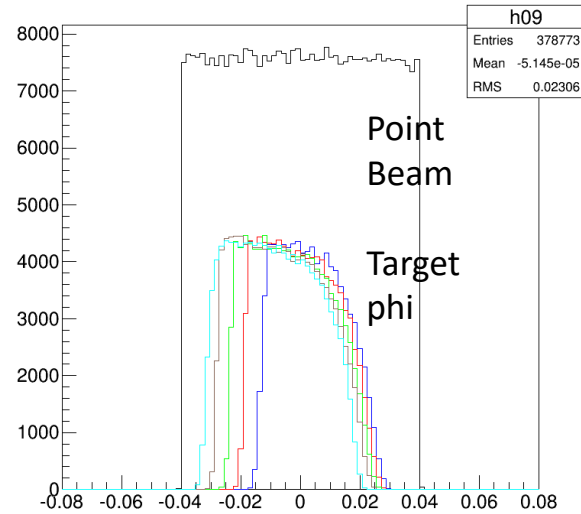
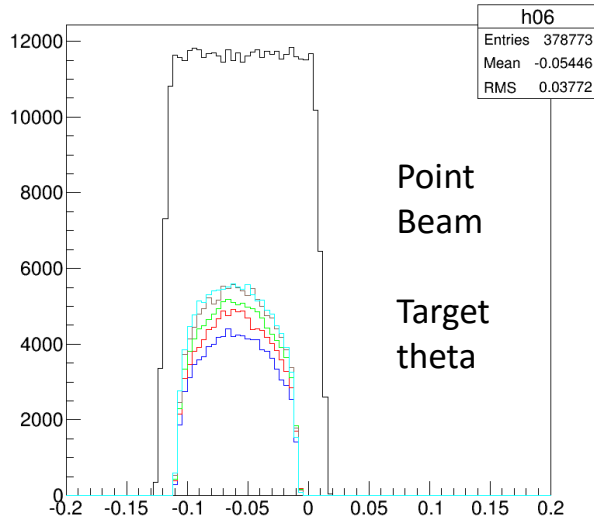
# Yields Drift Problem

## 2.2 GeV 2.5T Trans (Yields spread >3%)

Momentum /MeV	Material	Runs	Beam x/mm	Beam th/rad	Beam y/mm	Beam ph/rad	Exp. Yields	Note:
1003	8	3654	2.39	0.061	0.88	0.001	1.06	Beam down ~6 hours
1003	8	3646	1.60	0.061	1.55	0.001	1	
1247	7	3602	4.27	0.061	1.12	0.002	1.06	Beam off after HWP change
1247	7	3603	1.55	0.061	0.64	0.001	1	
1441	7	3556	2.34	0.061	0.84	0.001	1.06	slow raster size from 2cm to 1.8 cm
1441	7	3554	0.55	0.061	1.23	0.000	1	
1792	7	3730	1.89	0.062	1.39	0.001	1.17	5 days between
1792	7	3510	4.24	0.063	3.20	0.005	1	
1927	7	3716	2.43	0.062	1.58	0.001	1.04	Beam x drift slowly
1927	7	3722	4.34	0.064	2.65	0.004	1	
2072	7	3711	4.67	0.063	1.76	0.005	1.12	8.5hours gap, beam position and raster changed
2072	7	3690	0.00	0.060	0.53	0.001	1	
2072	8	3460	5.51	0.063	2.66	0.005	1.34	Beam off 2.5hour
2072	8	3454	5.14	0.063	3.13	0.005	1	

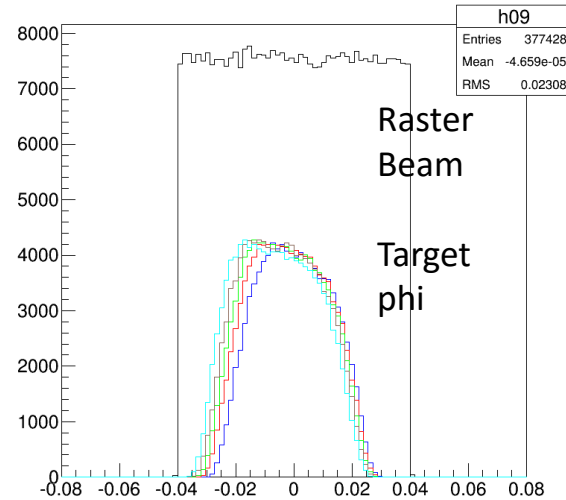
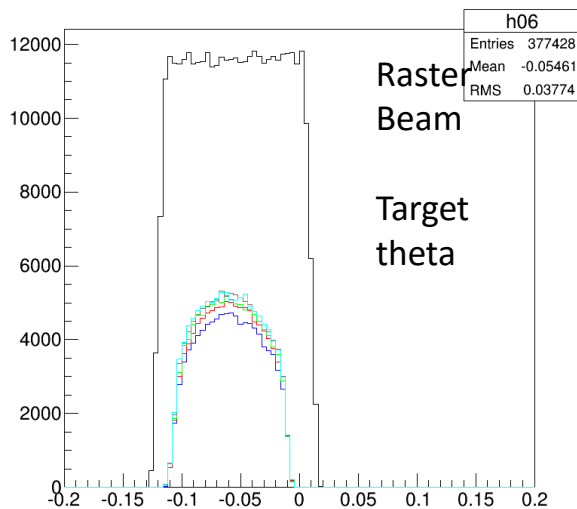
# Yields Drift Study from Simulation

## □ Beam along BPM x (horizontal)



**Point Beam:**  
 (-10, 0): Blue  
 (-5, 0): Red  
 (0, 0): Green  
 (5, 0): Light  
 (10, 0): Cyan

Angle unit: rad



**Raster Beam:**  
 (-5, 0): Blue  
 (-2, 0): Red  
 (0, 0): Green  
 (2, 0): Light  
 (5, 0): Cyan

# Yields Drift Study from Simulation

- Point Beam (x horizontal, y vertical), E2.2GeV, P1.7GeV, 2.5T

Horizontal x(mm)	Vertical y(mm)	Acceptance ratio	Yields ratio
0	0	1	1
5	0	1.07	1.27
-5	0	0.93	0.86
0	5	0.95	0.99
0	-5	1.01	1.01

- Raster Beam (x horizontal, y vertical), E2.2GeV, P1.7GeV, 2.5T

Horizontal x	Vertical y	Acceptance ratio	Yields ratio
0	0	1	1
-5	0	0.91	0.86
-2	0	0.97	0.95
2	0	1.03	1.05
5	0	1.03	1.13

## Yields Drift - 2.2GeV, 2.5T Trans

Momentum /MeV	Material	Runs	Beam x/mm	Beam th/rad	Beam y/mm	Beam ph/rad	Exp. Yields	Simu. Yields	Accp Ratio
1003	8	3654	2.39	0.061	0.88	0.001	1.06	1.03	1
1003	8	3646	1.60	0.061	1.55	0.001	1	1	1
1247	7	3602	4.27	0.061	1.12	0.002	1.06	1.22	1.02
1247	7	3603	1.55	0.061	0.64	0.001	1	1	1
1441	7	3556	2.34	0.061	0.84	0.001	1.06	1.12	1.02
1441	7	3554	0.55	0.061	1.23	0.000	1	1	1
1792	7	3730	1.89	0.062	1.39	0.001	1.17	0.79	1.02
1792	7	3510	4.24	0.063	3.20	0.005	1	1	1
1927	7	3716	2.43	0.062	1.58	0.001	1.04	0.85	1
1927	7	3722	4.34	0.064	2.65	0.004	1	1	1
2072	7	3711	4.67	0.063	1.76	0.005	1.12	1.33	1.03
2072	7	3690	0.00	0.060	0.53	0.001	1	1	1
2072	8	3460	5.51	0.063	2.66	0.005	1.34	1.03	1
2072	8	3454	5.08	0.068	2.24	0.005	1	1	1

Table generated from Monte Carlo method, cross checking with averaged acceptance with Rad function

## □ Summary

- Results similar to the previous study only using pBosted model
- Some setting agrees well, some setting even have opposite sign

## □ Short Term

- Acceptance and yields study

## □ Long term

- $g_2^P$  and various moments
- Expected graduate by summer 2016, depends