

# Simulation update

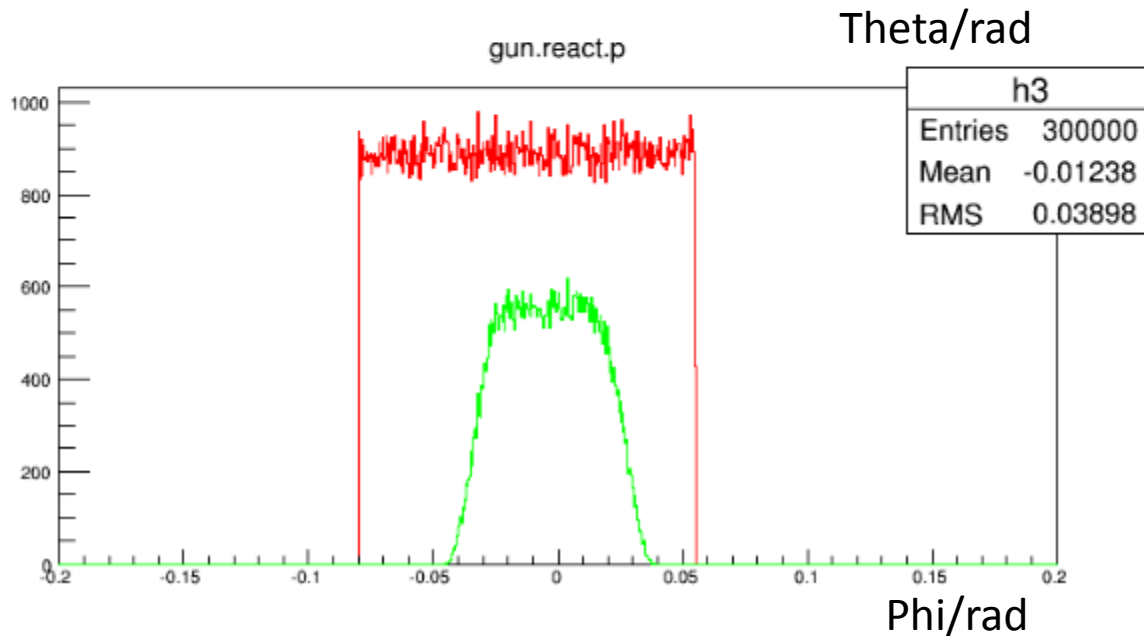
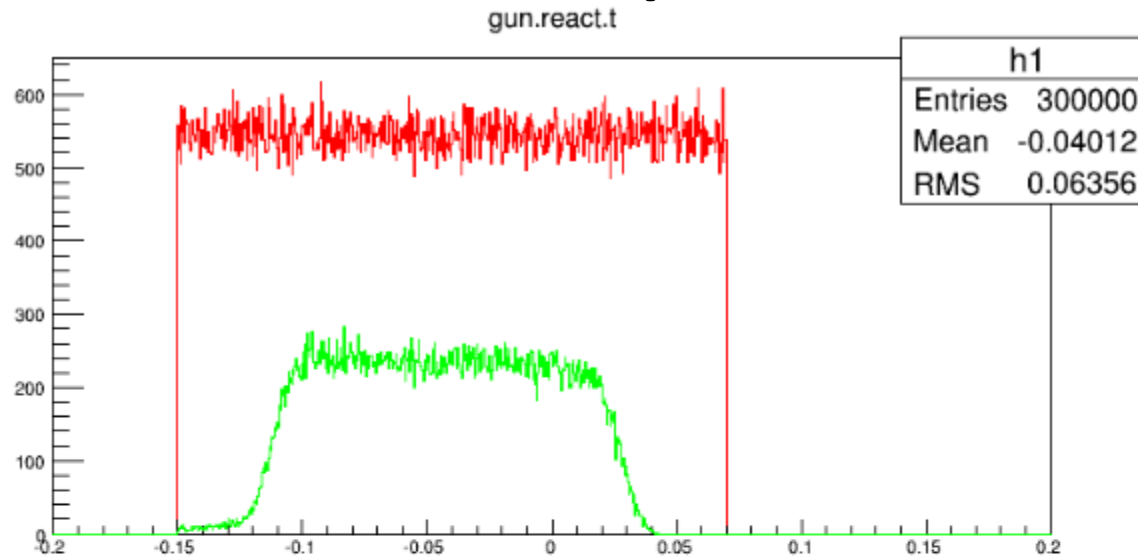
Last time:

Yields versus BPM information

Last Time

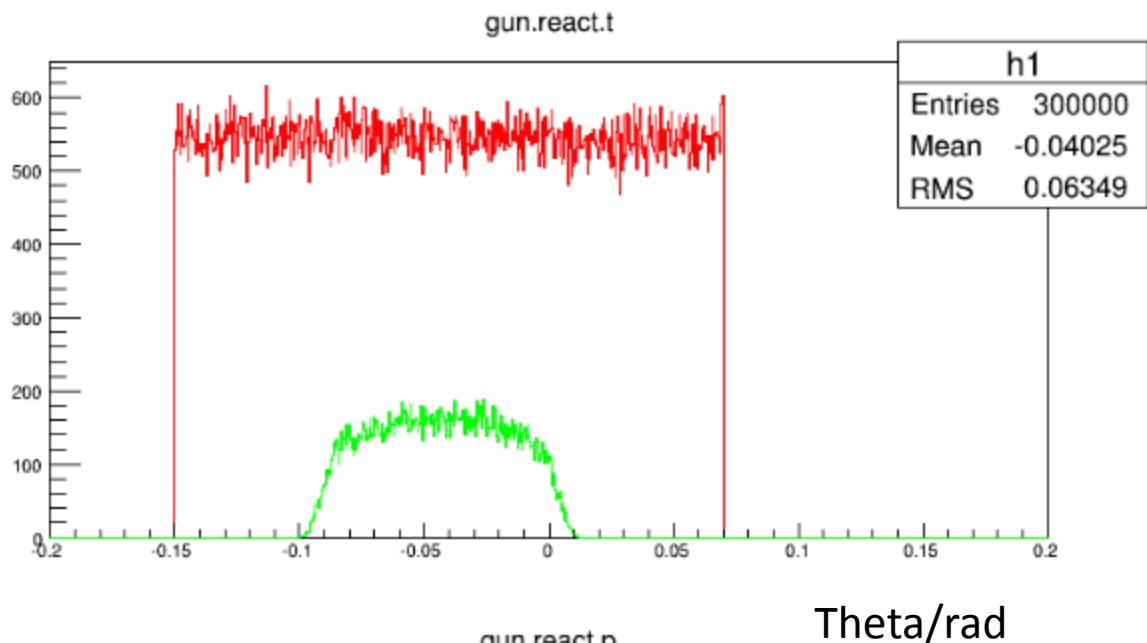
# Acceptance study

- Without Snake model acceptance
- Red (event generator)
- Green (accepted)

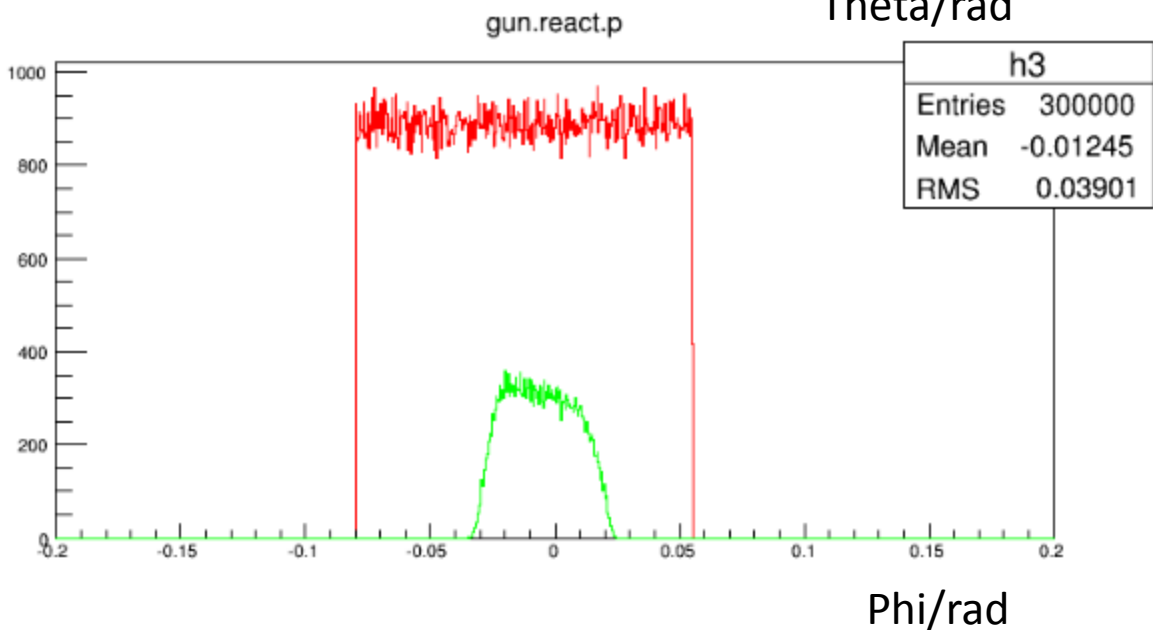


Last Time

# Acceptance study



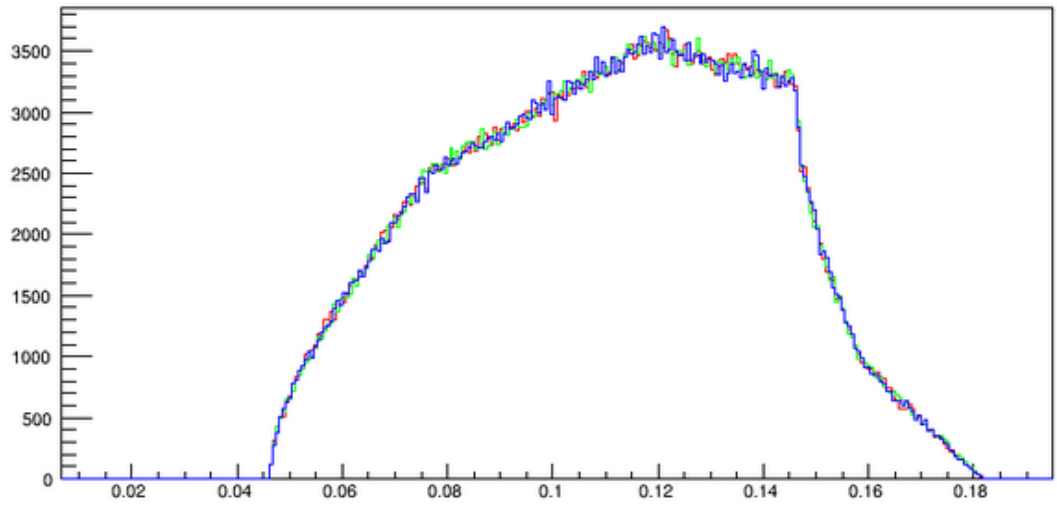
- Snake model acceptance (need tune)
- Red (event generator)
- Green (accepted)



- Simulation
- Theta:  
-0.13~0.04
- Phi:  
-0.05~0.05

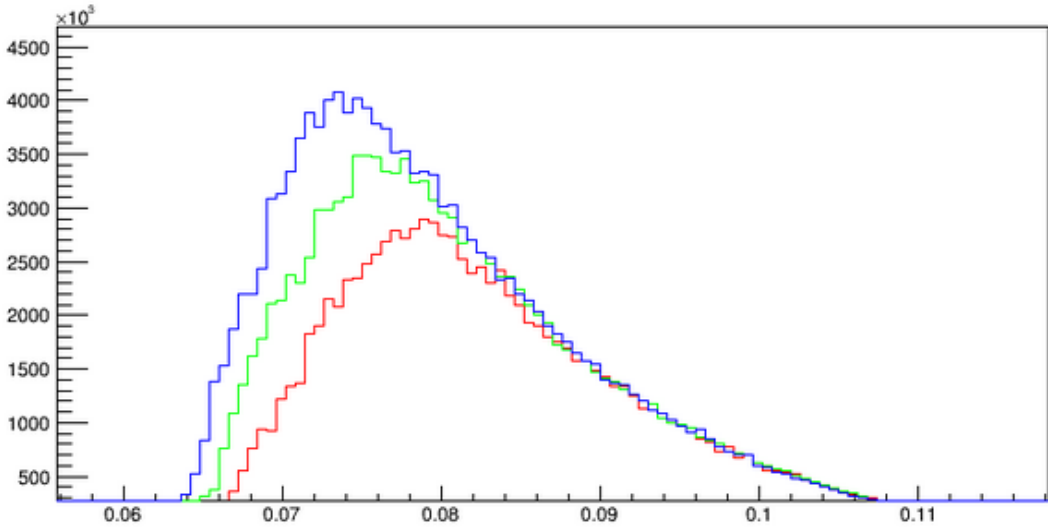
# Last Time Beam X dependence study

Total distribution for scattering angle



Red:  
x=0mm  
Green:  
x=2.5mm  
Blue:  
x=5mm

Good events distribution for scattering angle



← Weighted by Cross section

angle/rad

# Last Time Simulation Yields Update

(x ,y, theta, phi)	Old Yields	New Yields
(0, 0, 0.0636,0.0042)	1	1
X+2.5mm	1.167	1.202
X+5mm	1.333	1.375
Y+2.5mm	0.946	0.993
Y+5mm	0.896	0.988
Theta +1.5mrad	0.995	0.985
Theta +3mrad	0.985	0.972
Phi + 1.5mrad	1.148	1.135
Phi + 3mrad	1.318	1.309

Note:

- a. Use Pengjia's Beam coordinates  $\tan(\phi) = dx/dz$
- a. "Y+5mm" means only change Y pos to be 5mm
- b. All the yields normalized by the yields for configuration (0, 0, 0.0636,0.0042)
- c. not consider the relationship between phi versus x and theta versus y

# Dilution runs

Run #	Exp. yields	$x_{beam}$ (mm)	$y_{beam}$ (mm)	$\theta_{beam}$ (rad)	$\phi_{beam}$ (rad)	simu. Yields Meth. 1	Simu. Yields. Meth 2
Empty 3449	426489	4.98	1.55	0.0619	0.0055	1	1.001
Dummy 3448	426499	3.73	3.32	0.0635	0.0042	0.875	0.888

- Simu. Yields Meth.1 : use the average beam information as the inputs
- Simu. Yields Meth.2: use the event-by event beam information as the inputs
- Beam information: applied electron cuts already
- Corrected by effective target length
- To test simulation program

# Yields comparison

## 5T Longitudinal Elastic

Run #	$x_{beam}$ (mm)	$y_{beam}$ (mm)	$\theta_{beam}$ (rad)	$\phi_{beam}$ (rad)	Exp. Yields	Simu. Yields
5630	-0.74	-3.24	-6.7E-006	0.00032	1	1
5631	-0.73	-3.29	-2.5E-005	0.00031	0.9982	1.0025
5632	-0.56	-3.56	-0.00039	0.00045	0.9994	1.0238
5633	-0.47	-3.45	-0.00028	0.00058	1.0005	1.0442
5634	-0.10	-2.99	0.00020	0.00098	1.0006	1.1254
5635	-0.49	-3.54	-0.00030	0.00066	0.9980	1.0515
5636	-0.55	-3.48	-0.00026	0.00056	1.0016	1.0390

Material 18  
Septum 400016

# Yields comparison

## 5T Longitudinal Elastic

Run #	$x_{beam}$ (mm)	$y_{beam}$ (mm)	$\theta_{beam}$ (rad)	$\phi_{beam}$ (rad)	Exp. Yields	Simu. Yields
5641	-1.51	-3.11	-0.00023	-0.00040	1	1
5642	-1.73	-3.05	-0.00022	-0.00073	0.9978	0.9574
5652	-0.74	-3.76	-0.00041	0.00021	1.0821	1.1047
5654	-0.93	-3.66	-0.00035	6E-005	1.0440	1.0743
5655	-0.39	-3.66	-0.00032	0.00062	1.0438	1.1843
5656	-0.03	-3.64	-0.00033	0.00102	1.0323	1.2604
5658	0.53	-3.50	-0.00036	0.00183	1.0346	1.4412

Material 17

Septum 400016

Between 5642 and 5652 : Moller study