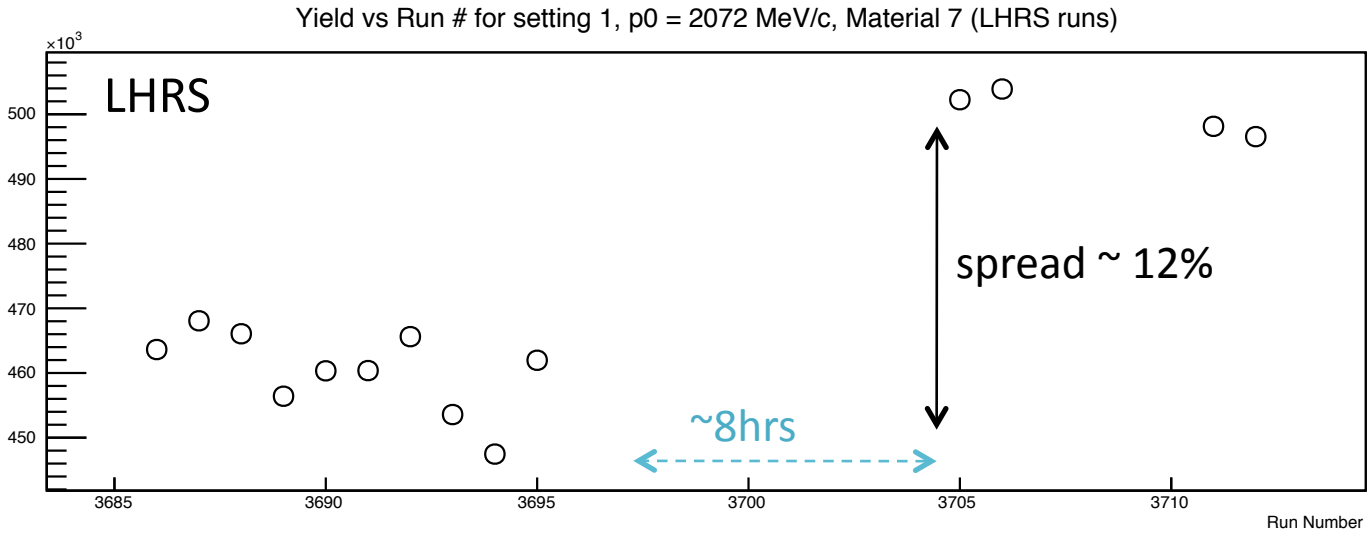
Spread in Yields

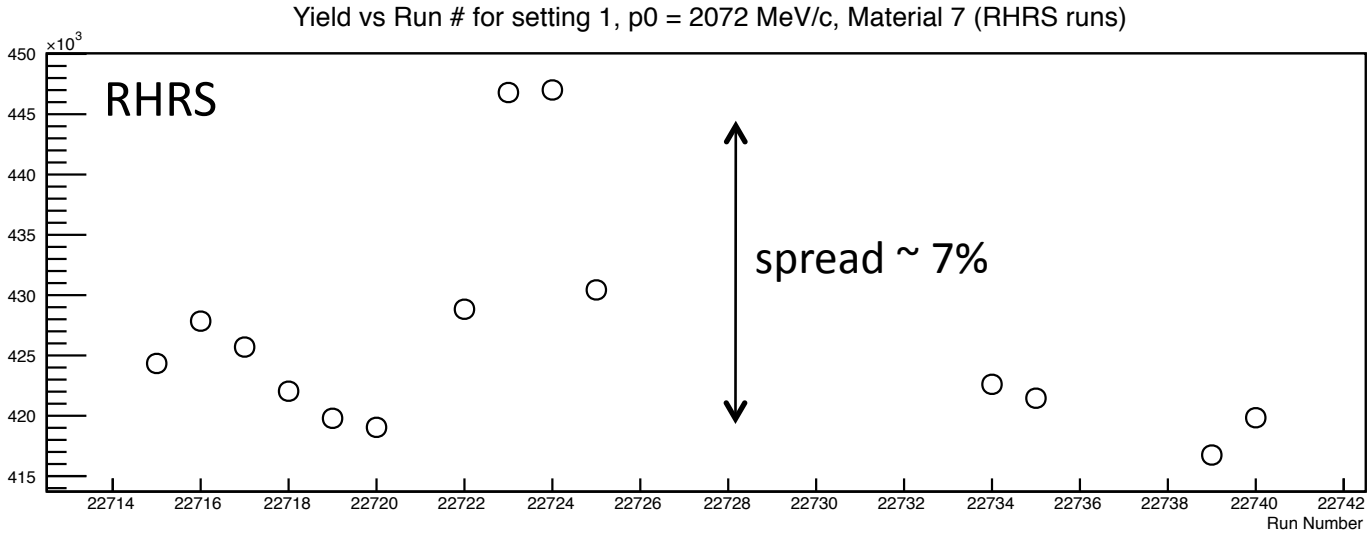
M. Cummings

5/21/14

$$Y = \frac{psN}{Q\epsilon_{det}LT}$$

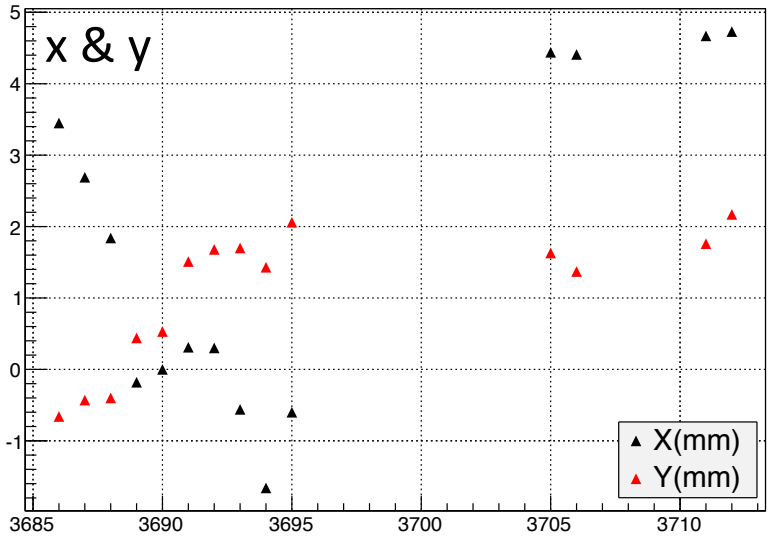
Setting 1, p0 = 2072 MeV/c, Material 7



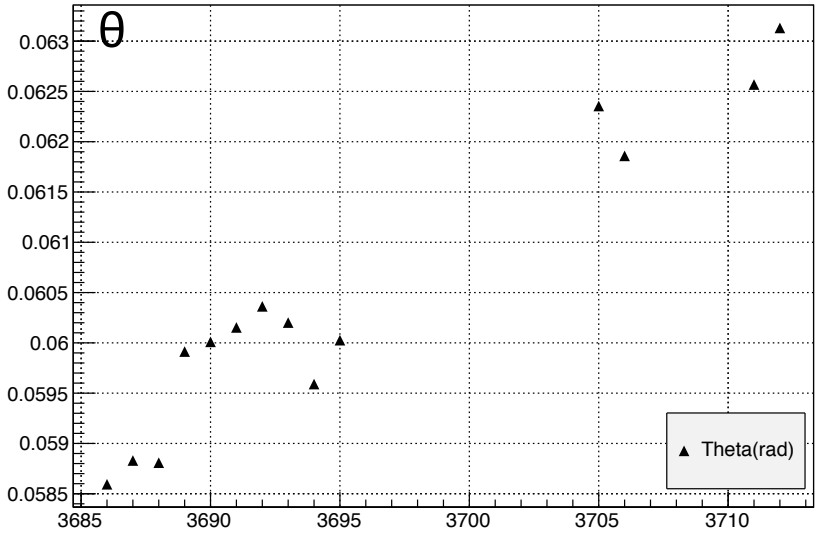


Setting 1, p0 = 2072 MeV/c, Material 7

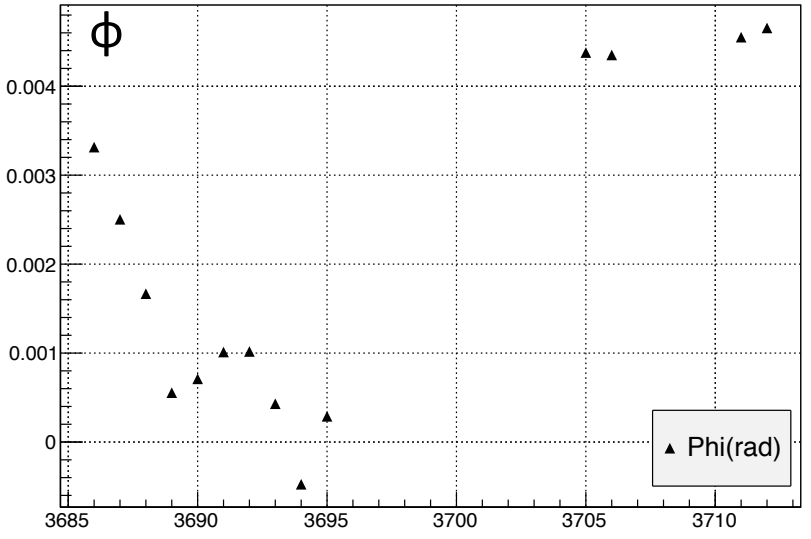
Beam Position vs Run # for setting 1, p0 = 2072 MeV/c, Material 7



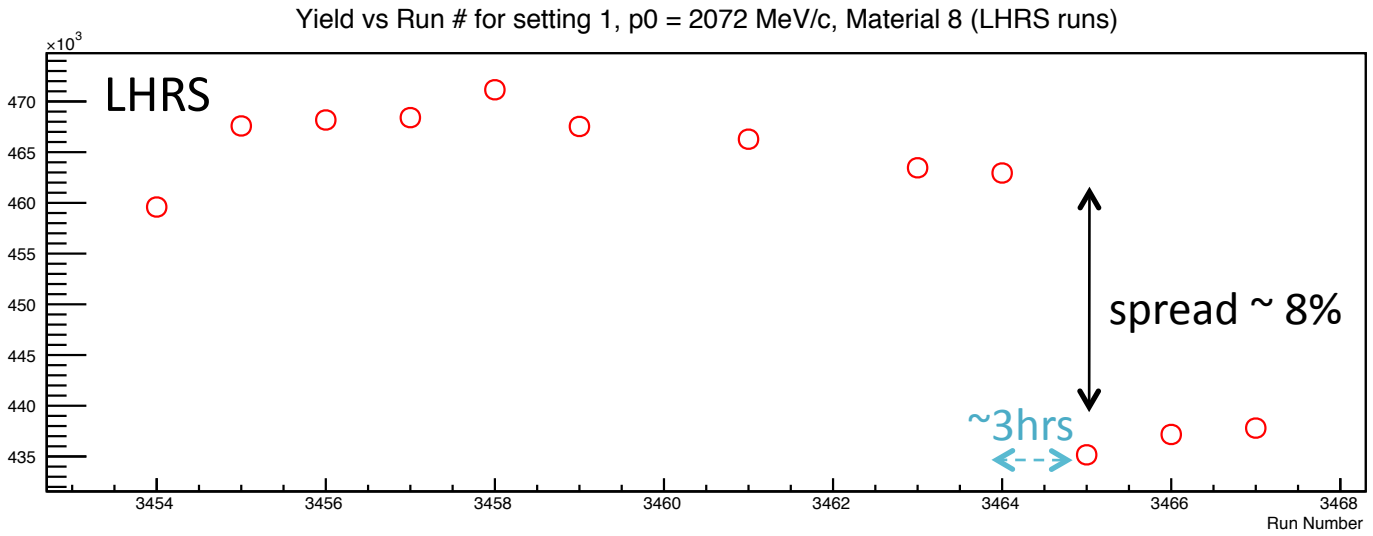
Incident Angle (theta) vs Run # for setting 1, p0 = 2072 MeV/c, Material 7

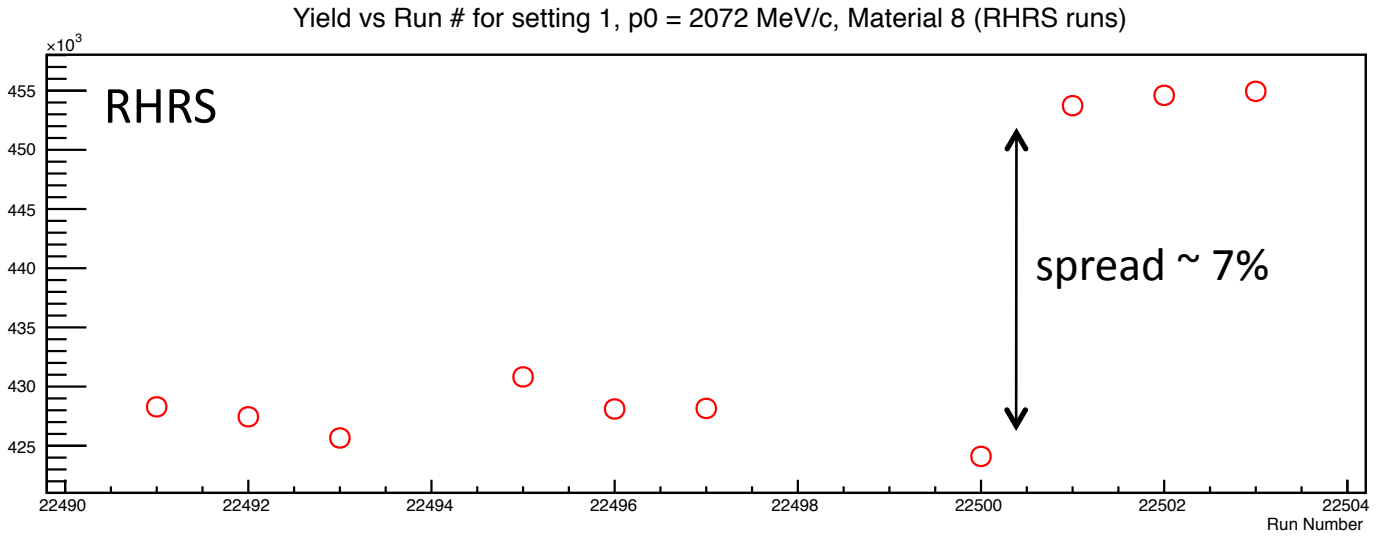


Incident Angle (phi) vs Run # for setting 1, p0 = 2072 MeV/c, Material 7



Setting 1, p0 = 2072 MeV/c, Material 8

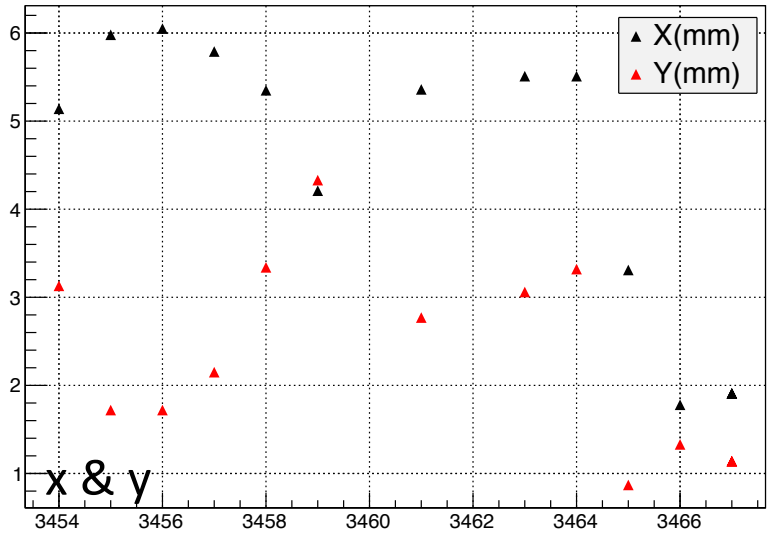




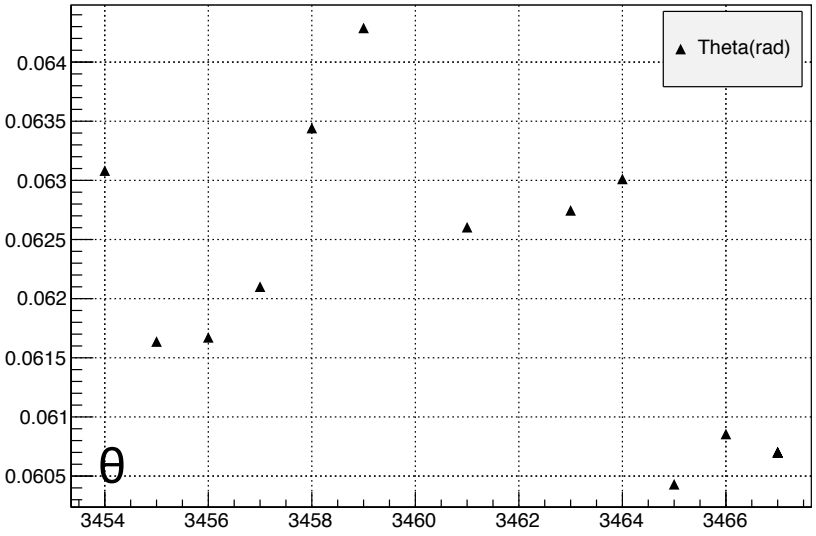
Setting 1, p0 = 2072 MeV/c, Material 8

LHRS

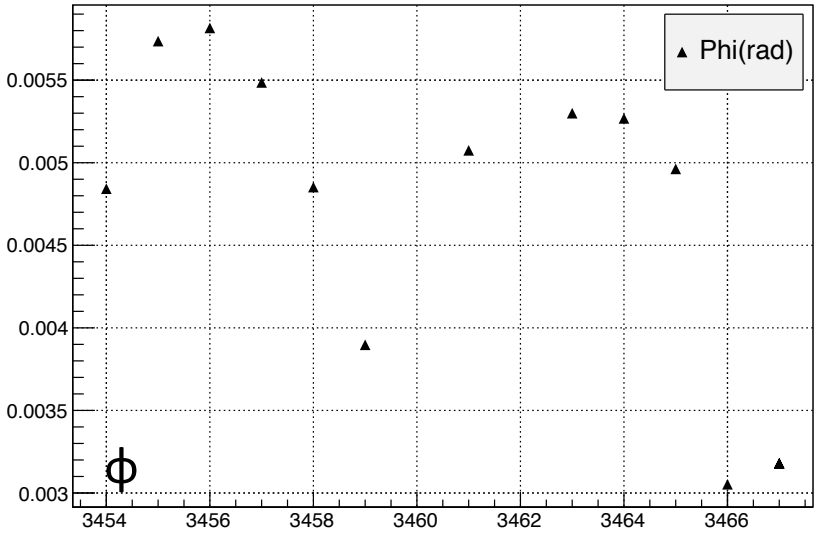
Beam Position vs Run # for setting 1, p0 = 2072 MeV/c, Material 8



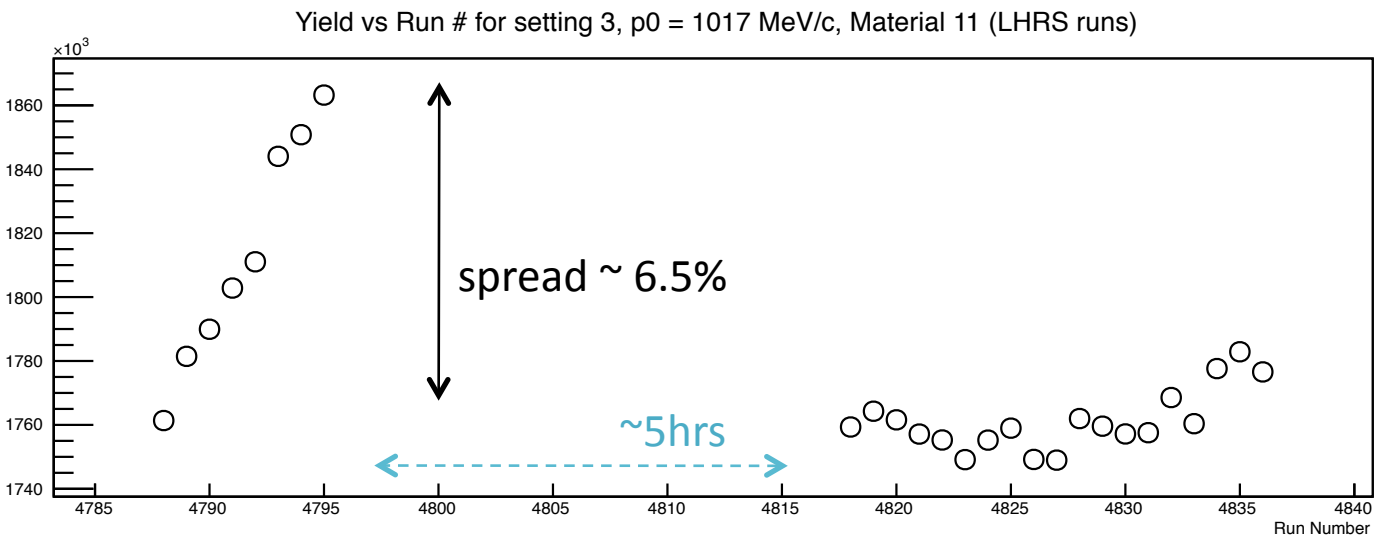
Incident Angle (theta) vs Run # for setting 1, p0 = 2072 MeV/c, Material 8

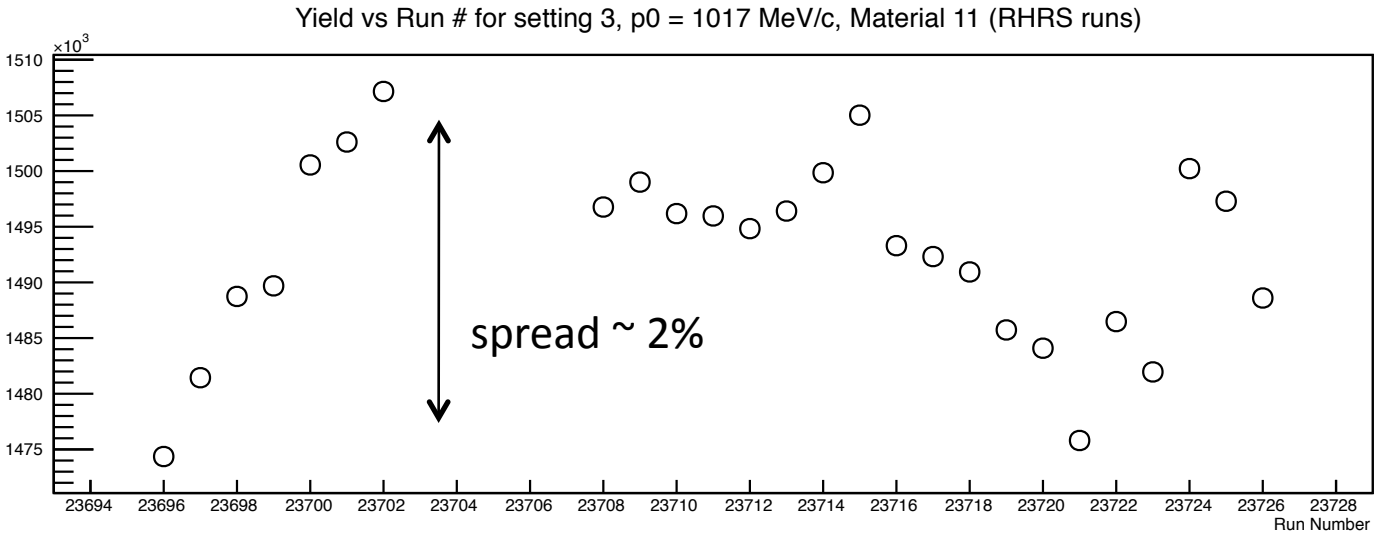


Incident Angle (phi) vs Run # for setting 1, p0 = 2072 MeV/c, Material 8

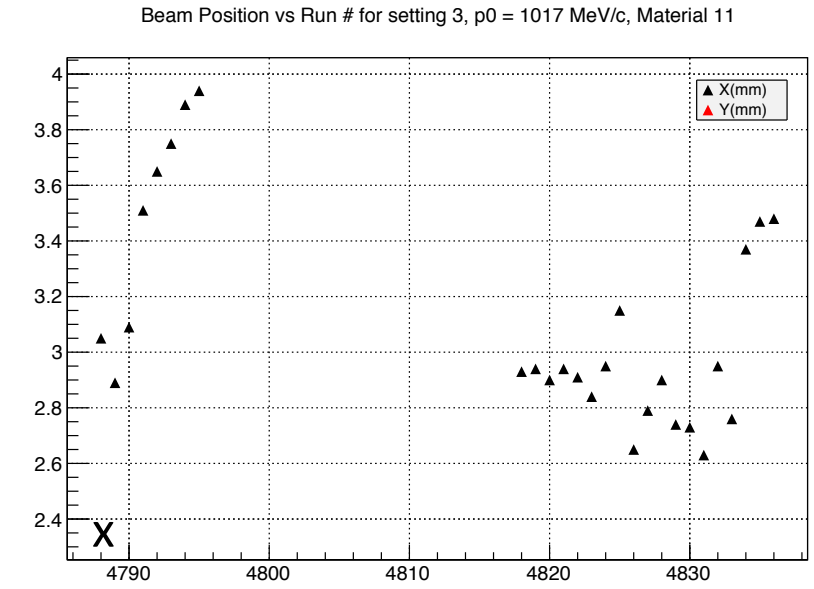


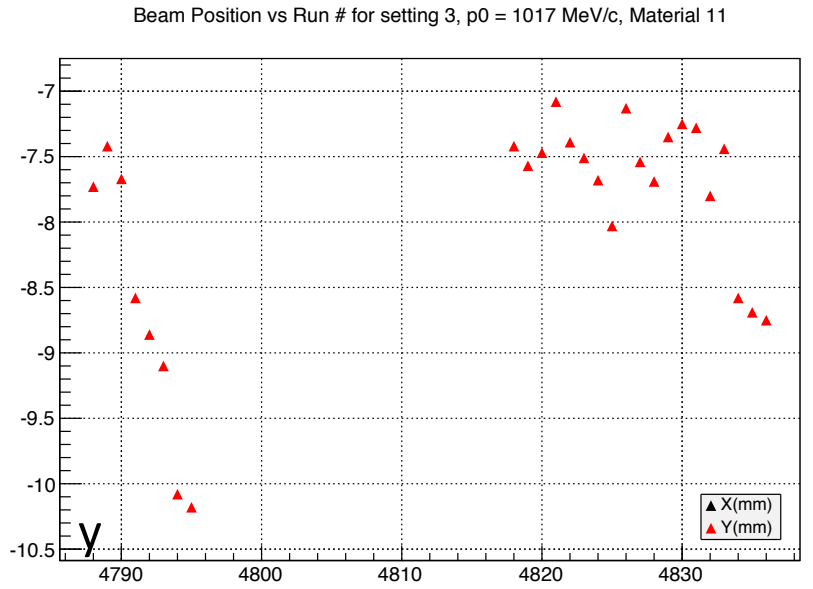
Setting 3, p0 = 1017 MeV/c, Material 11

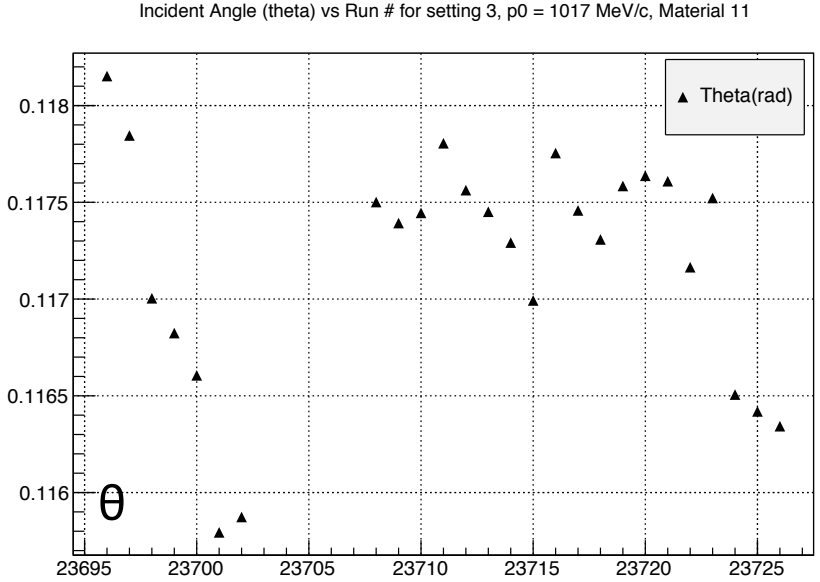


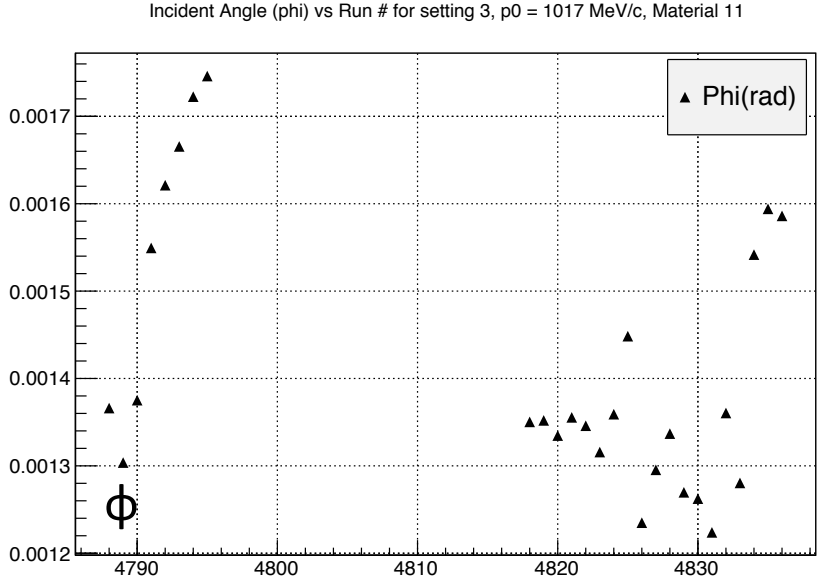


Setting 3, p0 = 1017 MeV/c, Material 11









LHRS					RHRS			
p0 (MeV/c)	material ID	Spread (%)	# of Runs		p0 (MeV/c)	material ID	Spread (%)	# of Runs
Setting 1: E = 2.2 GeV, Target Field = 2.5T, Transverse								
541	7	59.4	2		900	8	19.26	4
1792	7	17	16		1247	7	11.54	13
2072	7	11.86	14		1608	8	6.32	10
	8	7.94	12		1729	8	61.66	7
					1792	7	13.89	13
					1859	8	19.06	4
					2072	7	7.01	14
						8	18.51	11
Setting 2: E = 1.7 GeV, Target Field = 2.5T, Transverse								
1167	8	91.89	19					
1320	8	7.14	19					
1494	8	15.47	6					
1589	7	7.22	22					
Setting 3: E = 1.1 GeV, Target Field = 2.5T, Transverse								
845	11	44.67	20		899	11	50.86	21
1017	11	6.33	27					
Setting 5: E = 2.2 GeV, Target Field = 5T, Transverse								
1504	20	84.39	4		1600	19	11.09	7
1600	19	9.83	7					
Setting 6: E = 3.3 GeV, Target Field = 5T, Transverse								
2492	20	9.69	8		2070	19	24.41	8
2651	20	37.7	10			20	39.6	7
					2202	20	9.94	9

Summary Table

- 235 total settings (different momentum/material/HRS arm)
- 27 settings with spread > 5%
  - 11 of those have just 1 bad run
- Settings in yellow have a spread in yields that corresponds with beam down time

Material ID

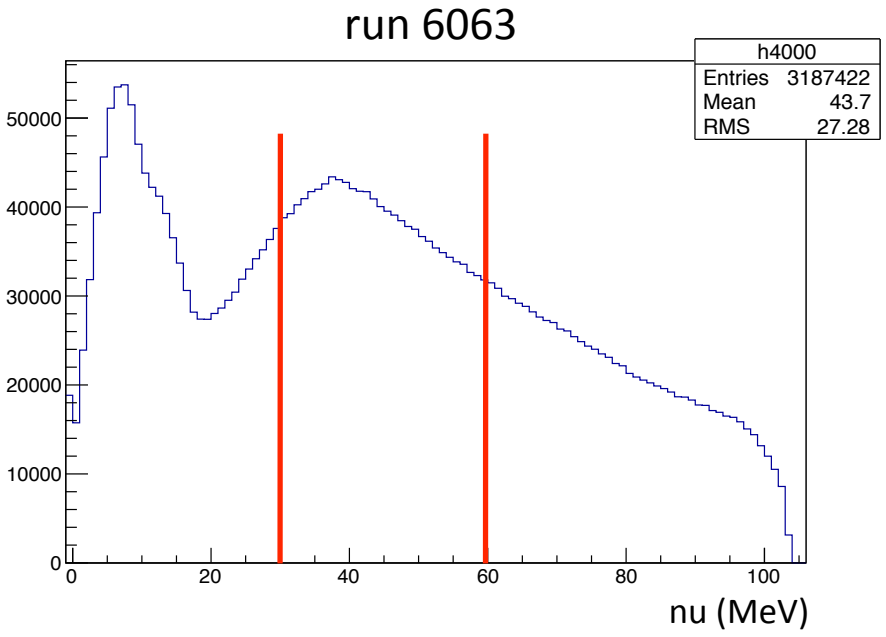
- Added to mysql for production & packing fraction runs
- For runs where target encoder didn't read out, target position was determined from HALOG
  - 3 runs with conflicting information: 3504, 3769, 3865 (pf runs)

Quick Update on P_bP_t Check

$$A \equiv \frac{\nu_z z^* G_M^2 + \nu_x x^* G_E G_M}{(\tau G_M^2 + \epsilon G_E^2)/[\epsilon(1+\tau)]} \qquad A = \frac{1}{f P_b P_t} A_{exp}$$

Form Factor Parameterization from:

"Relativistic Transverse Images of the Proton Charge and Magnetic Densities", Venkat/Arrington/Miller/Zhan (2010) http://arxiv.org/pdf/1010.3629.pdf



For 2.2 GeV, 5T Transverse:

A_{pred} = -0.00521917
A_{raw} = 0.000607234
P_t = 66.2% (average)
P_b = 80.4%

↓

f = 0.22

still needs some work!