Jefferson Lab Alignment Group

Data Transmittal

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DETAILS: data: step2b\hallc\qweak\100616A

Attached to this transmittal are the results from the June 16th, 2010 R3 wire chamber rotation repeatability survey. The goal of the survey was to check for movements directly at the detectors by measuring visible alignment targets at the production positions.

The data shows the center of the reference fiducial location which is different from the previous survey (memo C1286) where the data was transformed from observations on the end Z plates. Additionally, these coordinates are given at the alignment target locations, not the hole centers which were calculated for memo C1286. Only detectors Leia and Hans were checked with the bulk of the information carried out on chamber Leia.

For the Leia data, the 5 production positions (0° (home), +45°, +90°, -45°, -90°) were measured once each to obtain the “standard” coordinates. After each move to +/- 45° and +/-90°, Leia was returned to the home position and measured there again. The detector would then return to the +/- 45° or +/-90° position for a second set of measurements and then back to home.

Leia was also measured at the home position after the detector was slid along the arms then extended out again to measure the effect this would have on the reproducibility of the sliding motion.

Hans was measured at the +/- 90° position with 1 repeated survey. Those results are compared.

The results show the coordinates at the production position for each wire chamber relative to the QTOR magnet center. The coordinates taken at the “standard” position are given, and the coordinate differences between these and the repeated position are shown as deltas.

The coordinates and differences are in millimeters with X coordinate transverse to the beamline positive beam left, Y in the vertical position, positive up and Z along the beamline positive downstream,. The values for the deltas are repeated position minus the original.

Leia Data			
Leia Home Original (0 degrees)			
Target	X(mm)	Y (mm)	Z(mm)
A	-3097.8	1153.1	5133.5
G	-2722.4	-1145.5	4964.5
H	-3098.5	-1145.6	5133.5

Repeat 1 on Home after -45					Epoch - Home Orig		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-3098.0	1152.6	5133.5		-0.2	-0.5	0.0
G	-2722.1	-1145.9	4964.4		0.3	-0.5	-0.1
H	-3098.2	-1146.2	5133.4		0.2	-0.6	-0.1
Repeat 2 on Home after -45					Epoch - Home Orig		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-3098.1	1152.5	5133.4		-0.2	-0.6	-0.1
G	-2722.1	-1146.1	4964.4		0.3	-0.6	-0.2
H	-3098.2	-1146.3	5133.3		0.3	-0.7	-0.2
Repeat 1 on Home after -90 deg					Epoch - Home Orig		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-3098.0	1152.6	5133.4		-0.1	-0.5	-0.1
G	-2722.1	-1146.0	4964.4		0.3	-0.5	-0.1
H	-3098.2	-1146.2	5133.4		0.3	-0.6	-0.1
Repeat 2 on Home after -90 deg					Epoch - Home Orig		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-3097.6	1153.6	5133.4		0.3	0.4	-0.1
G	-2722.3	-1145.1	4964.4		0.1	0.3	-0.1
H	-3098.4	-1145.2	5133.4		0.0	0.4	-0.1
Repeat 1 on Home after +45					Epoch - Home Orig		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-3097.9	1153.2	5133.7		-0.1	0.1	0.2
G	-2722.5	-1145.5	4964.7		-0.1	0.0	0.2
H	-3098.6	-1145.6	5133.7		-0.1	0.0	0.2
Repeat 2 on Home after +45					Epoch - Home Orig		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-3098.0	1153.2	5133.7		-0.2	0.0	0.2
G	-2722.5	-1145.5	4964.7		-0.1	-0.1	0.2
H	-3098.6	-1145.7	5133.7		-0.1	-0.1	0.2

Leia Data Continued							
Repeat 1 on Home after +90					Epoch - Home Orig		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-3098.0	1153.1	5133.7		-0.2	-0.1	0.2
G	-2722.5	-1145.6	4964.8		-0.1	-0.1	0.2
H	-3098.6	-1145.8	5133.8		-0.1	-0.2	0.3
Repeat 2 on Home after +90					Epoch - Home Orig		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-3098.0	1153.1	5133.7		-0.2	-0.1	0.2
G	-2722.5	-1145.6	4964.7		-0.1	-0.2	0.2
H	-3098.6	-1145.8	5133.8		-0.1	-0.2	0.3

Data at Standard Positions							
Leia at -45 degrees							
Target	X(mm)	Y (mm)	Z(mm)				
A	-1367.2	3007.1	5136.6				
B	-1102.3	2741.6	4965.4				
G	-2729.7	1117.9	4968.5				
H	-2995.3	1384.1	5137.8				
Leia at -45 degrees repeated					-45 repeat minus -45 original		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	-1366.6	3007.3	5136.6		0.7	0.3	0.0
B	-1101.7	2741.8	4965.4		0.6	0.2	0.0
G	-2729.4	1118.5	4968.5		0.3	0.6	0.0
H	-2994.9	1384.7	5137.7		0.3	0.6	-0.1
Leia at -90 degrees							
Target	X(mm)	Y (mm)	Z(mm)				
A	1160.5	3094.6	5135.1				
B	1160.3	2719.6	4963.9				
G	-1138.4	2720.1	4968.9				
H	-1138.3	3096.2	5138.0				
Leia at -90 degrees repeated					-90 repeat minus -90 original		
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)
A	1160.8	3094.4	5134.9		0.3	-0.1	-0.3
B	1160.6	2719.4	4963.6		0.3	-0.2	-0.2
G	-1138.3	2720.2	4968.8		0.2	0.1	-0.1
H	-1138.0	3096.3	5138.0		0.3	0.1	0.0

Leia Data Continued			
Leia at +45 degrees			
Target	X(mm)	Y (mm)	Z(mm)
B	-2743.1	-1115.2	4960.3
G	-1115.1	-2738.5	4961.9
H	-1380.8	-3005.0	5130.4

Leia at +45 degrees repeated				+45 repeat minus +45 org		
Target	X(mm)	Y (mm)	Z(mm)	X	Y	Z
B	-2743.8	-1113.4	4960.3	-0.7	1.8	0.0
G	-1116.9	-2737.7	4962.0	-1.8	0.8	0.1
H	-1382.7	-3004.1	5130.4	-2.0	0.9	0.0

Leia at +90 degrees			
Target	X(mm)	Y (mm)	Z(mm)
A	-1153.7	-3104.3	5127.8
B	-1154.3	-2728.7	4957.6
H	1145.2	-3102.0	5128.9

Leia at +90 degrees repeated				+90 repeat minus +90 org		
Target	X(mm)	Y (mm)	Z(mm)	X	Y	Z
A	-1155.8	-3103.5	5127.7	-2.1	0.8	-0.1
B	-1156.1	-2728.0	4957.5	-1.9	0.8	-0.2
H	1143.0	-3102.7	5128.8	-2.1	-0.7	-0.1

Slide in and out at the home (0 degree) position										
Repeat 1 after sliding in and out				slide 1- original home						
Target	X(mm)	Y (mm)	Z(mm)	X	Y	Z				
A	-3090.7	1153.9	5133.7	7.1	0.7	0.2				
G	-2719.7	-1145.5	4964.7	2.7	0.0	0.2				
H	-3095.8	-1144.9	5133.8	2.6	0.7	0.3				
Repeat 2 after sliding in and out				slide 2 - original home				Slide 2 - Slide 1 values		
Target	X(mm)	Y (mm)	Z(mm)	X	Y	Z		X	Y	Z
A	-3090.4	1153.9	5133.7	7.4	0.8	0.2		0.3	0.1	0.1
G	-2719.6	-1145.5	4964.7	2.8	0.0	0.2		0.2	0.0	0.1
H	-3095.7	-1144.9	5133.8	2.8	0.7	0.3		0.2	0.0	0.0
Repeat 3 after sliding in and out				slide 3 - original home				Slide 3 - Slide 1 values		
Target	X(mm)	Y (mm)	Z(mm)	X	Y	Z		X	Y	Z
A	-3090.2	1154.0	5133.7	7.6	0.8	0.2		0.5	0.1	0.1
G	-2719.5	-1145.4	4964.7	2.9	0.0	0.2		0.2	0.0	0.1
H	-3095.6	-1144.8	5133.8	2.9	0.8	0.3		0.3	0.1	0.0

HANS								
Hans at -90 degrees								
Target	X(mm)	Y (mm)	Z(mm)					
A	1136.8	-2740.5	4956.8					
B	1134.4	-3115.6	5127.8					
G	-1161.9	-2724.9	4959.4					
H	-1164.2	-3100.4	5129.3					
Hans at -90 deg repeated					-90 degrees repeated - original			
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)	
A	1136.6	-2740.6	4956.7		-0.2	-0.1	-0.1	
B	1134.2	-3115.7	5127.8		-0.2	-0.1	0.0	
G	-1162.1	-2724.8	4959.2		-0.2	0.1	-0.2	
H	-1164.5	-3100.3	5129.1		-0.2	0.1	-0.2	
Hans at +90 degrees								
Target	X(mm)	Y (mm)	Z(mm)					
A	-1139.5	2731.9	4965.1					
B	-1137.7	3106.6	5137.2					
G	1159.3	2720.0	4966.0					
H	1161.1	3095.0	5136.9					
Hans at +90 deg repeated					+90 degrees repeated - original			
Target	X(mm)	Y (mm)	Z(mm)		X(mm)	Y (mm)	Z(mm)	
A	-1137.8	2732.7	4965.2		1.7	0.7	0.1	
B	-1135.8	3107.4	5137.3		1.9	0.7	0.1	
G	1161.0	2719.3	4966.0		1.7	-0.8	0.1	
H	1163.1	3094.3	5137.0		2.0	-0.8	0.1	