Jefferson Lab Alignment Group

Data Transmittal

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DETAILS: Data: calcs\hallc\qweak\qtor\step2a && data\step2a\hallc\qweak\100122a

The Q-Tor magnet coils were surveyed after the eighth coil was installed. This work was carried out over a 2 day period starting January 21st, 2010. The data shown below shows the ideal position of the magnet with respect to the overall CEBAF coordinate system. Also shown are the ideal yaw pitch and roll angles for the coils in degrees.

From the found locations of the fiducials on each individual coil a reverse least squares transformation was carried out to determine the coils position relative to the ideal center. From the results of the transformations, an overall position for each coil plus the deltas from the ideal yaw, pitch and roll were determined. The results are given below, with the deltas from the ideal center shown in millimeters with respect to the beam following coordinate system. The delta yaw, delta pitch show the difference from the ideal beam trajectory. The delta roll, is from the ideal roll angle shown for each individual coil.

A +z (bfs) indicates the coil is too far downstream, a +x indicates the coil is to the beam left and a +y means the coil is high. A positive delta yaw indicates a counter clockwise rotation (when looked at from above), a positive delta pitch means the coil is pointing upwards from the upstream beam to the downstream beam, and a + roll indicates the coil is rotated clockwise from the ideal roll angle.

There is an acknowledged problem with coil #6 and it will need to be repositioned.

	Z (m)	X(m)	Y(m)		Yaw (deg)	Pitch (deg)	Roll (deg)
Ideal Center	-398.25596	-132.27064	99.99500		-142.48324	0.00000	*
	BFS Coordinates						
Coil	**Z mm)**	**X (mm)**	**Y (mm)**	**Roll angle**	**Delta yaw**	**Delta pitch**	**Delta Roll**
Coil 2	1.08	-1.42	0.73	22.50	0.0015	0.0063	-0.0335
Coil 3	0.13	-0.69	-2.17	67.50	0.0009	0.0089	-0.0476
Coil 4	0.14	0.59	-2.12	112.50	0.0066	-0.0052	-0.0203
Coil 5	-0.12	0.86	-1.97	157.50	-0.0030	0.0020	-0.0106
Coil 6	7.27	2.03	-10.70	202.50	0.0856	-0.2355	0.0481
Coil 7	-0.02	-0.78	-1.56	247.50	0.0048	0.0000	0.0189
Coil 8	0.53	1.13	-1.76	292.50	0.0033	0.0060	0.0673
Coil 9	0.03	0.80	-0.41	337.50	-0.0007	0.0029	0.0183

(* Depends on individual coil – see angles in column labeled “roll angle”)