LCLS II 2Q10 Fiducialization Report

Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-30
Barcode # : 4212
Mfg. S/N : MFG SN 06

Coordinate System Setup

Spatial Alignment

The Spatial Alignment of the magnet is created through a composite best-fit of the pole tips. Each pole tip scanned 0.150 inch inboard from the upstream magnet face and the downstream magnet face. A composite best-fit of the upstream poles and the downstream poles is made with the nominal pole tip shape and location. An axis is created through the two best-fit centerpoints. This axis is the spatial alignment of the magnet and defines the Z axis.

Planar Alignment

The Planar Alignment of the magnet is the created by averaging the rotations of the composite best-fits of the upstream pole tips and downstream pole tips. This direction defines the Y and X directions of the magnet.

Coordinate Origins

The origins of the magnet coordinate system are as follows. The XY origin lies on the axis of spatial alignment. The Z origin is the intersection of the mid-plane between the upstream and downstream magnet faces and the Z axis.

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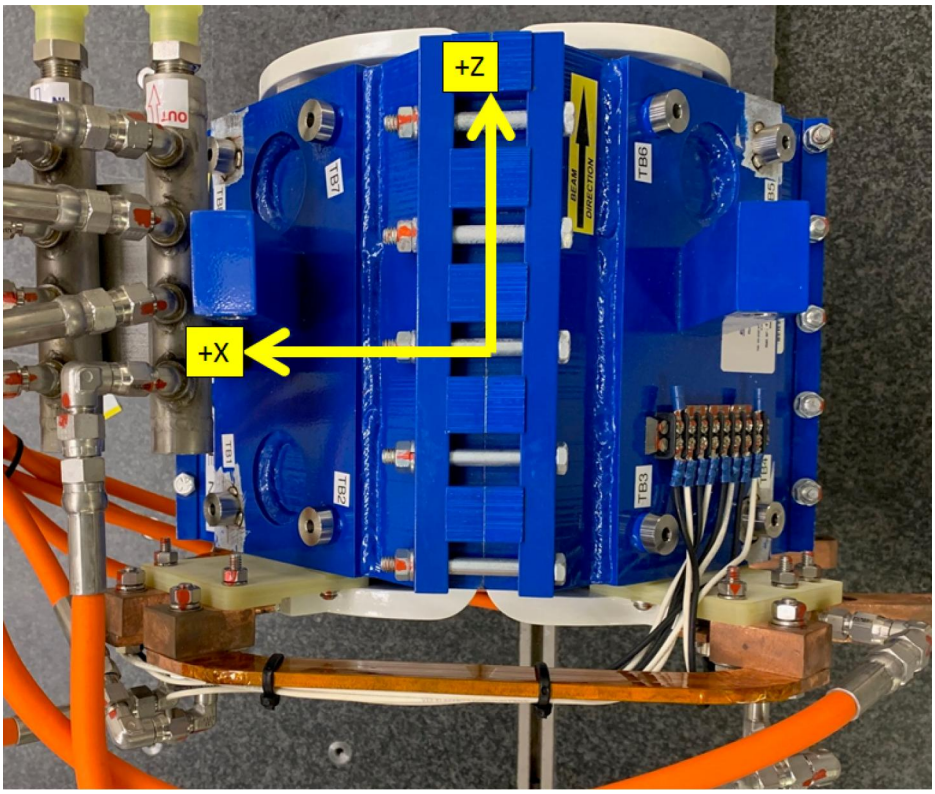
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.5298	3.9784	-3.7383
TB 2	3.9608	6.4817	-3.7325
TB 3	-3.9805	6.4668	-3.7394
TB 4	-6.5455	3.9631	-3.7055
TB 5	-6.5107	3.9943	3.7422
TB 6	-3.9765	6.4667	3.7421
TB 7	3.9662	6.4736	3.7358
TB 8	6.5203	3.9833	3.7280

Tooling Ball Locations are 1 inch above Tooling Ball Adapter Plane
Dimensions in Inch

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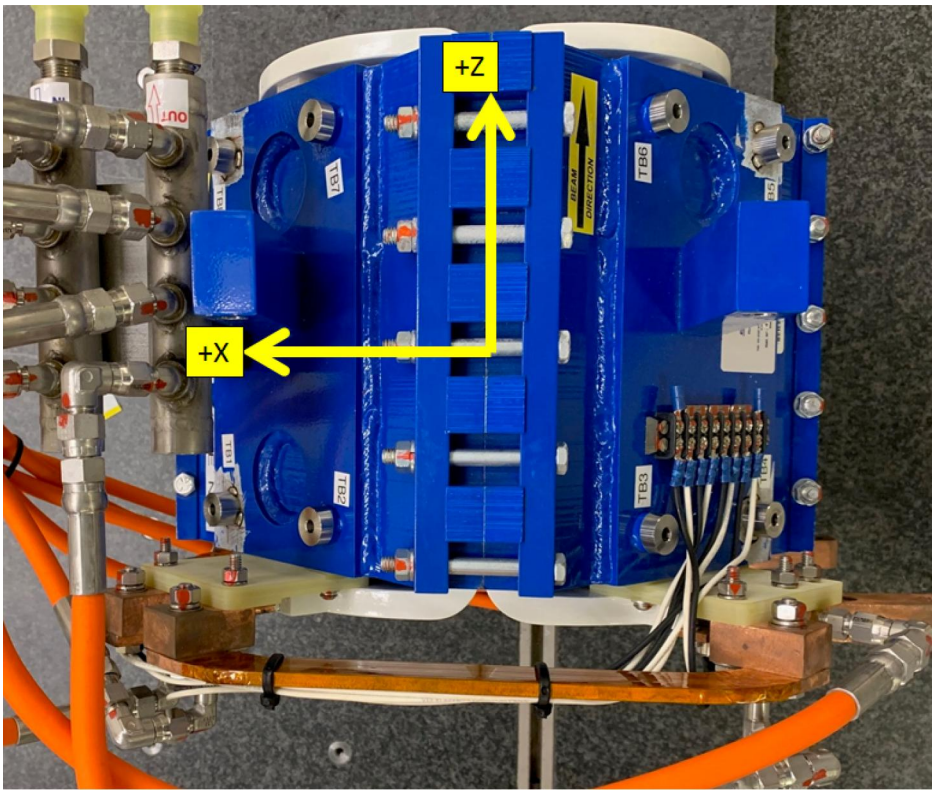

Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.0431	3.4928	-3.7406
TB 2	3.4761	5.9942	-3.7334
TB 3	-3.4933	5.9821	-3.7385
TB 4	-6.0573	3.4789	-3.7064
TB 5	-6.0238	3.5093	3.7437
TB 6	-3.4906	5.9811	3.7433
TB 7	3.4801	5.9876	3.7356
TB 8	6.0338	3.4980	3.7289

Tooling Ball Locations are 5/16 inch above Tooling Ball Adapter Plane
Dimensions in Inch

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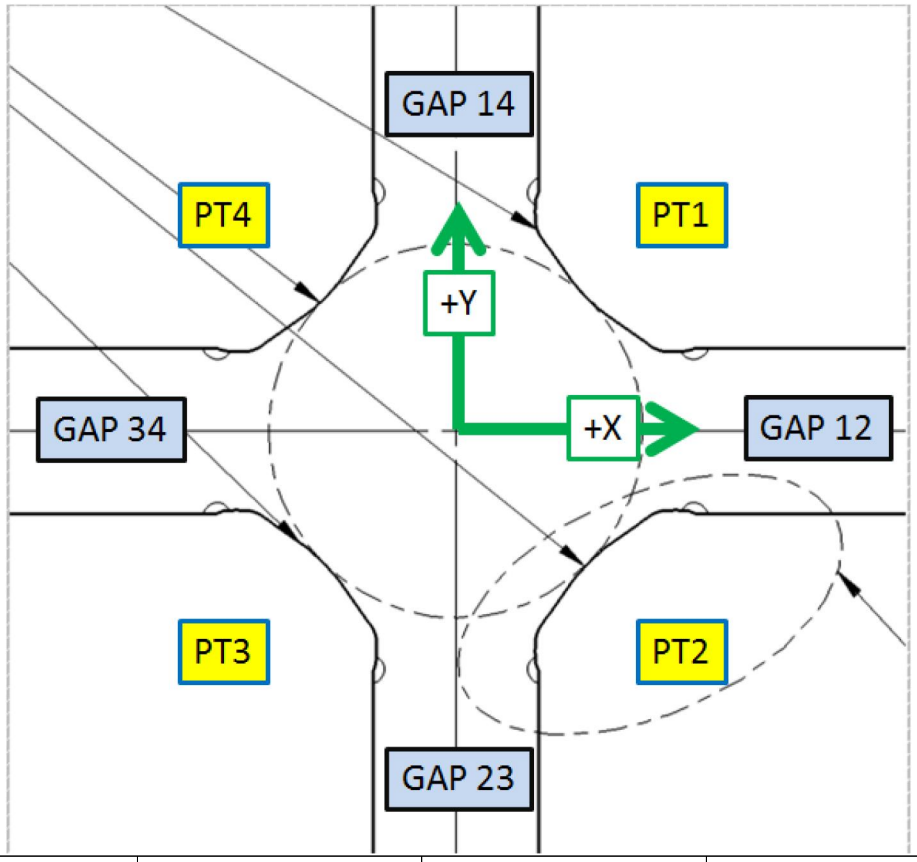
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02742	2.02786
PT Distance 2-4	2.026	2.0275	2.0279
Gap 1-2	0.8602	0.85856	0.8583
Gap 2-3	0.8602	0.85861	0.85497
Gap 3-4	0.8602	0.85802	0.85867
Gap 1-4	0.8602	0.85936	0.85866

Dimensions in Inch

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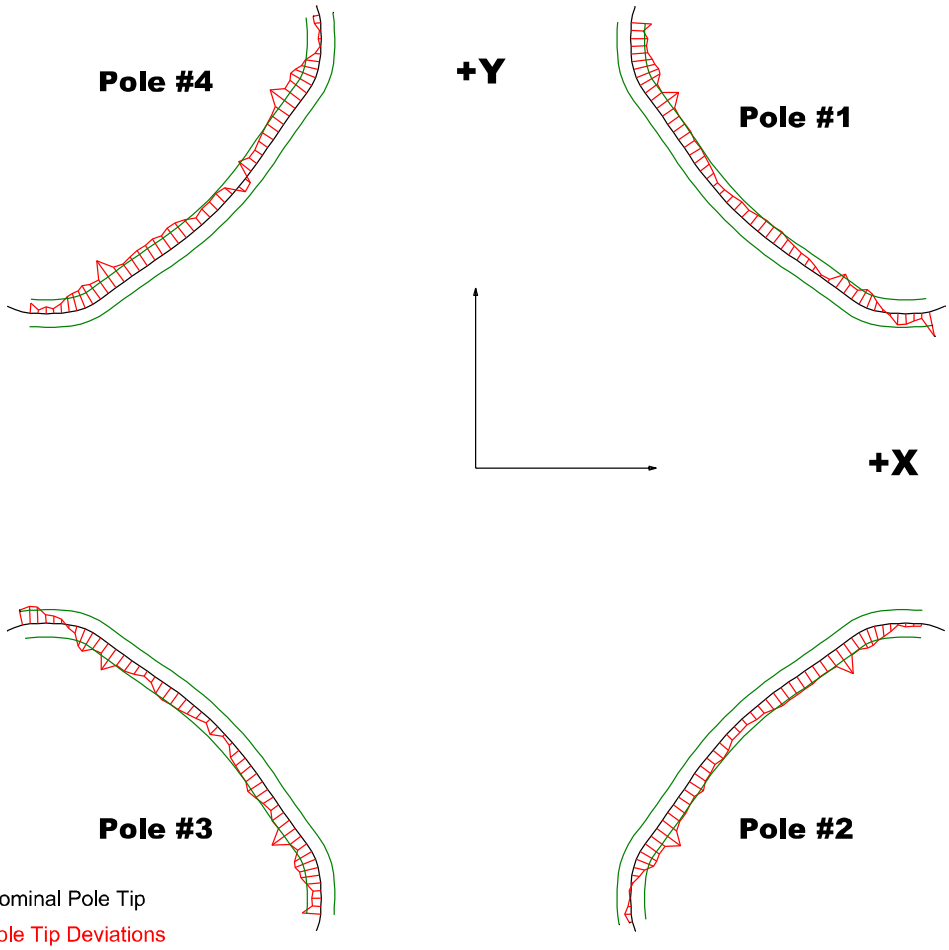
Composite Best-fit of Pole Tips, Downstream



Black = Nominal Pole Tip
Red = Pole Tip Deviations
Green = +/- .001 Tolerance

Dimensions in Inch

Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00197	-0.00218	-0.00209	-0.0024
Max. Dev.	0.00182	0.0005	0.00128	0.0006

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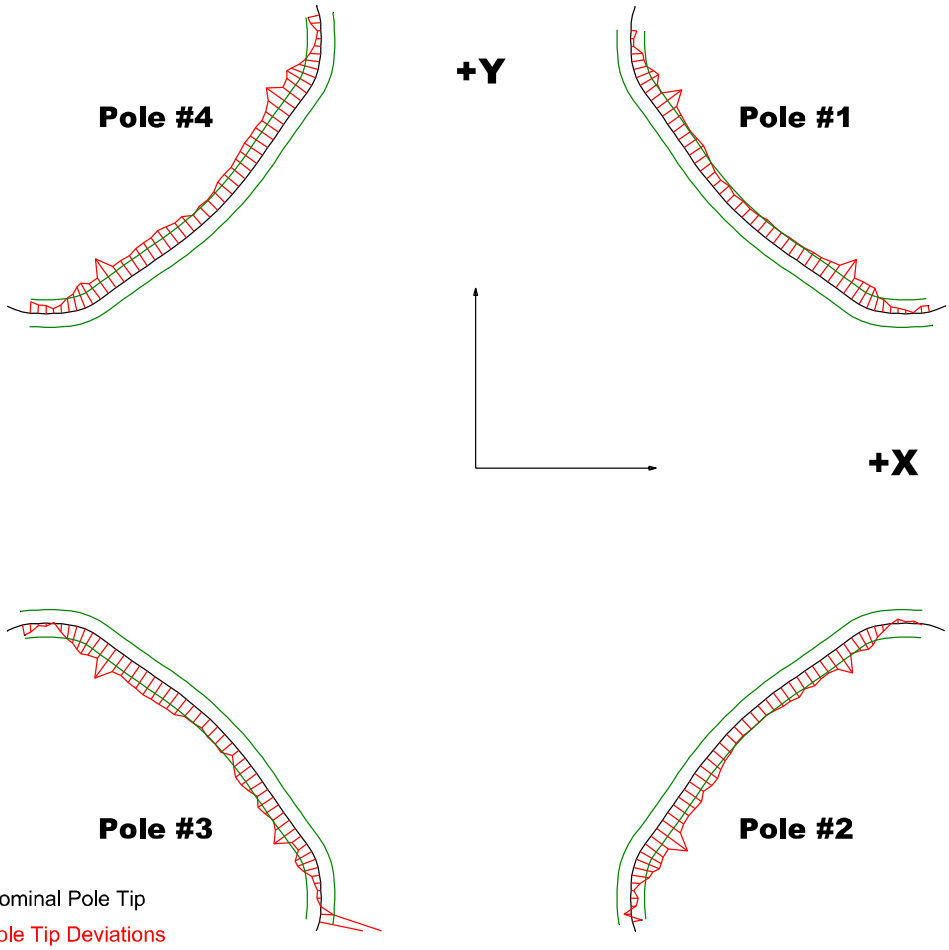
Composite Best-fit of Pole Tips, Upstream



Black = Nominal Pole Tip
Red = Pole Tip Deviations
Green = +/- .001 Tolerance

Dimensions in Inch

Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00252	-0.00276	-0.00261	-0.00257
Max. Dev.	-0.00007	0.00055	0.00693	-0.00025

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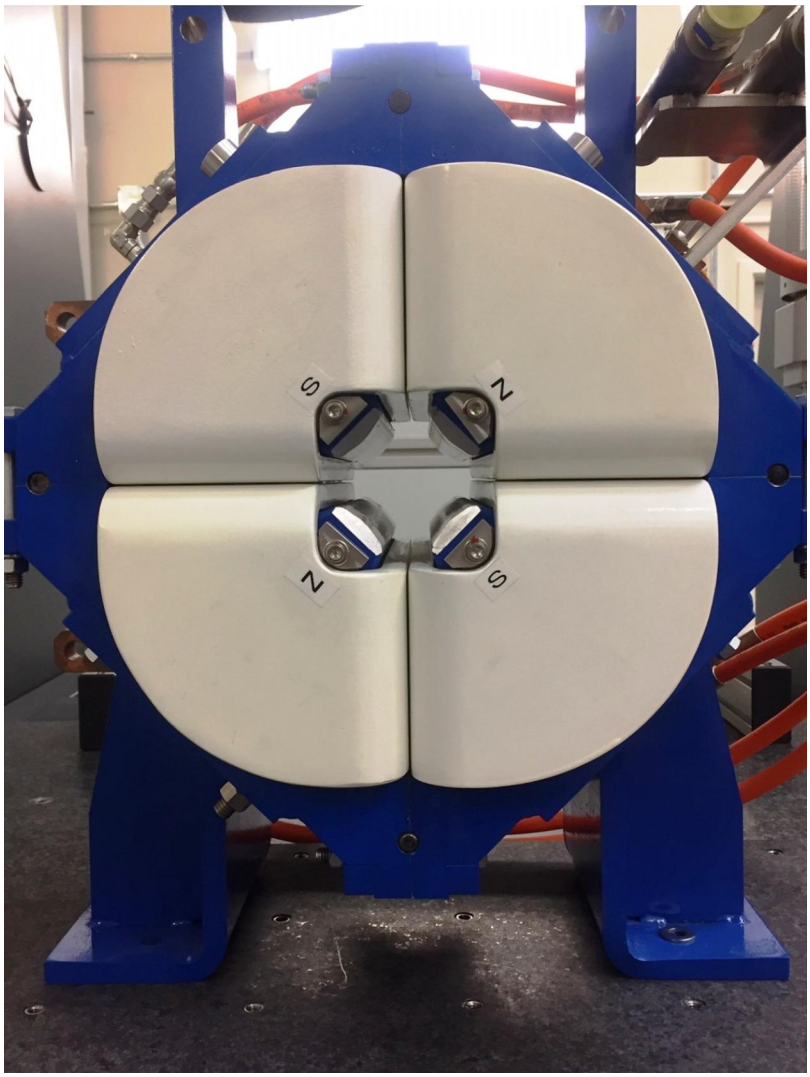
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	-0.02018
Angle in Milliradians :	-0.35224

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