LCLS II 2Q10 Fiducialization Report

Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-30
Barcode # : 4213
Mfg. S/N : MFG SN 07

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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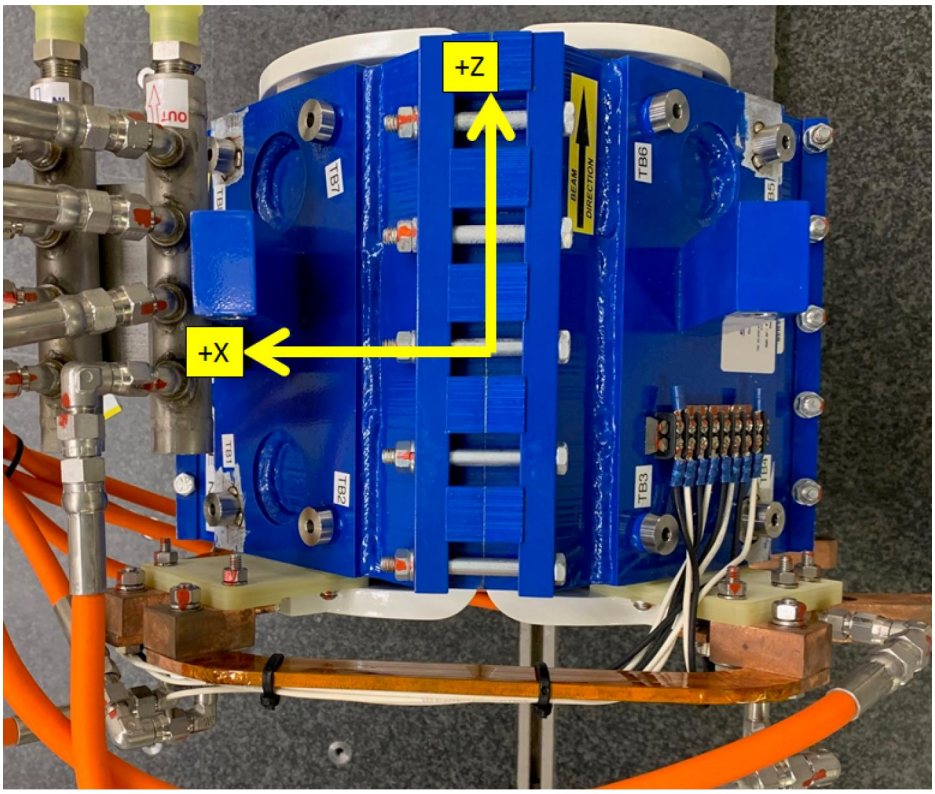
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.5379	3.9650	-3.7063
TB 2	3.9694	6.4747	-3.7360
TB 3	-3.9757	6.4728	-3.7270
TB 4	-6.5448	3.9630	-3.7240
TB 5	-6.5241	3.9819	3.7537
TB 6	-3.9814	6.4638	3.7502
TB 7	3.9697	6.4749	3.7504
TB 8	6.4872	4.0128	3.7427

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

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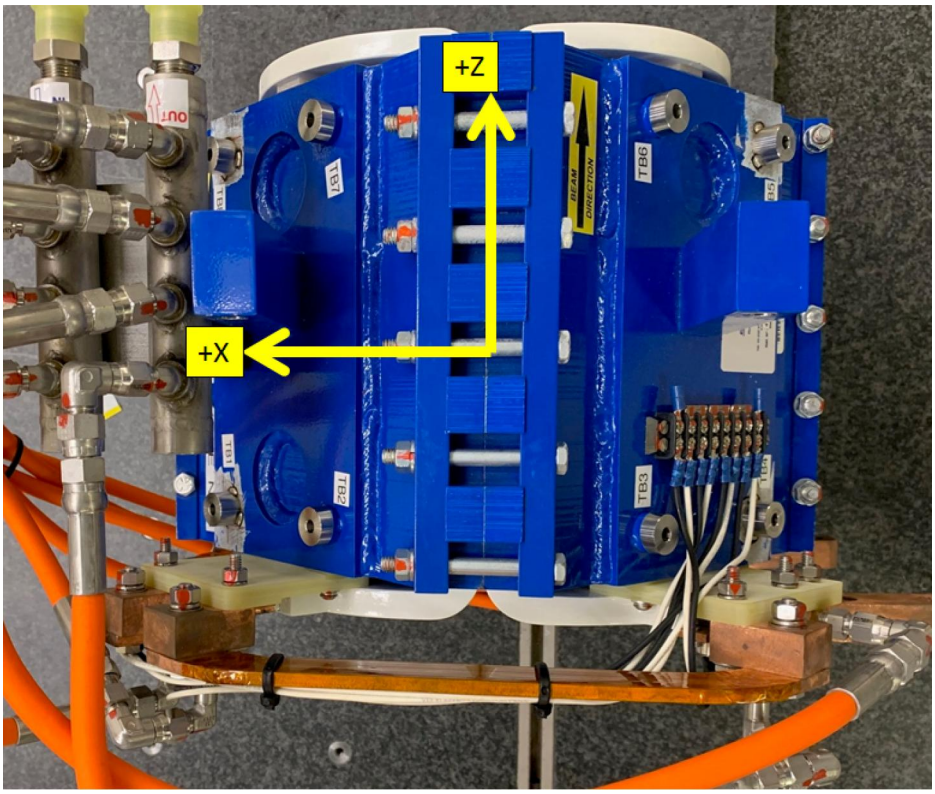
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.0517	3.4798	-3.7076
TB 2	3.4826	5.9892	-3.7334
TB 3	-3.4888	5.9871	-3.7281
TB 4	-6.0569	3.4793	-3.7249
TB 5	-6.0370	3.4970	3.7528
TB 6	-3.4953	5.9784	3.7473
TB 7	3.4835	5.9882	3.7473
TB 8	6.0025	3.5271	3.7426

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

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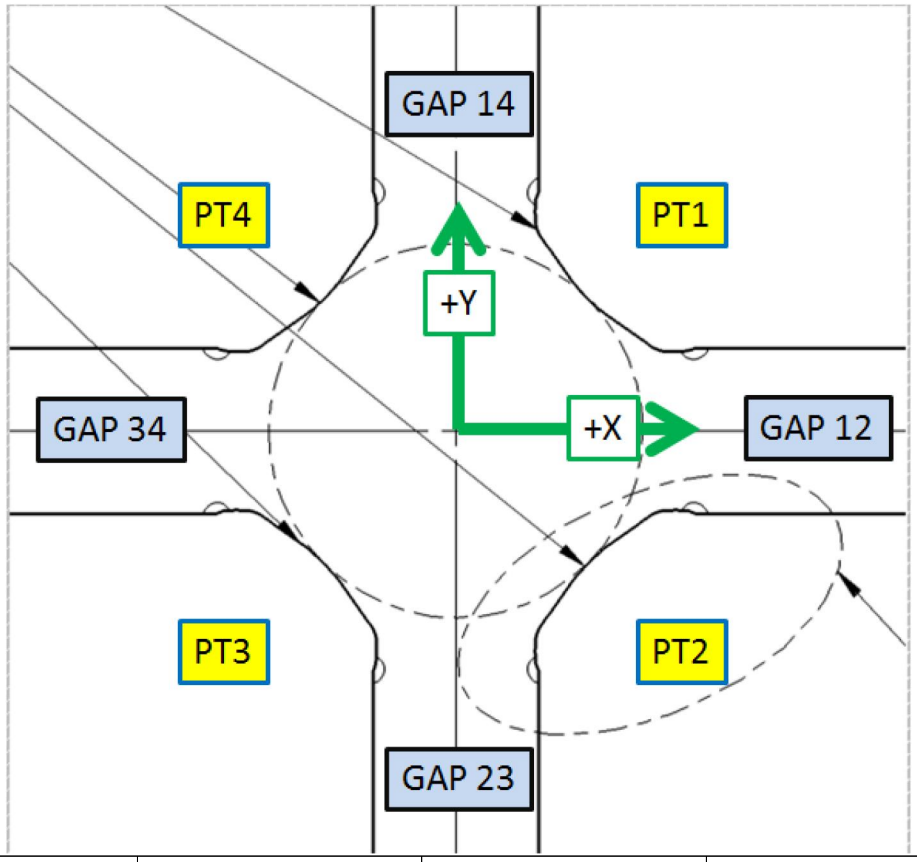
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02708	2.02636
PT Distance 2-4	2.026	2.0277	2.02795
Gap 1-2	0.8602	0.85902	0.8594
Gap 2-3	0.8602	0.86045	0.86051
Gap 3-4	0.8602	0.85936	0.85982
Gap 1-4	0.8602	0.85859	0.85817

Dimensions in Inch

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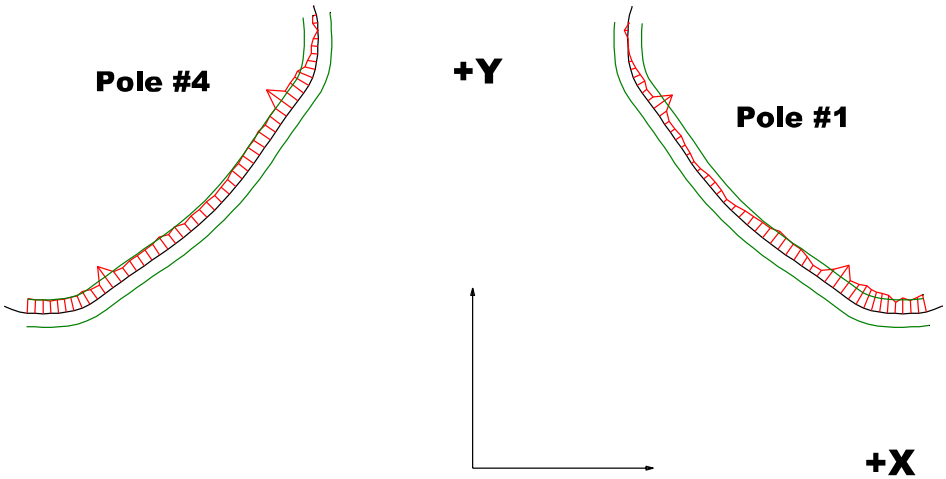
Composite Best-fit of Pole Tips, Downstream



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.	-0.00199	-0.00266	-0.00196	-0.00232
Max. Dev.	0.00029	0.00178	0.00019	-0.00001

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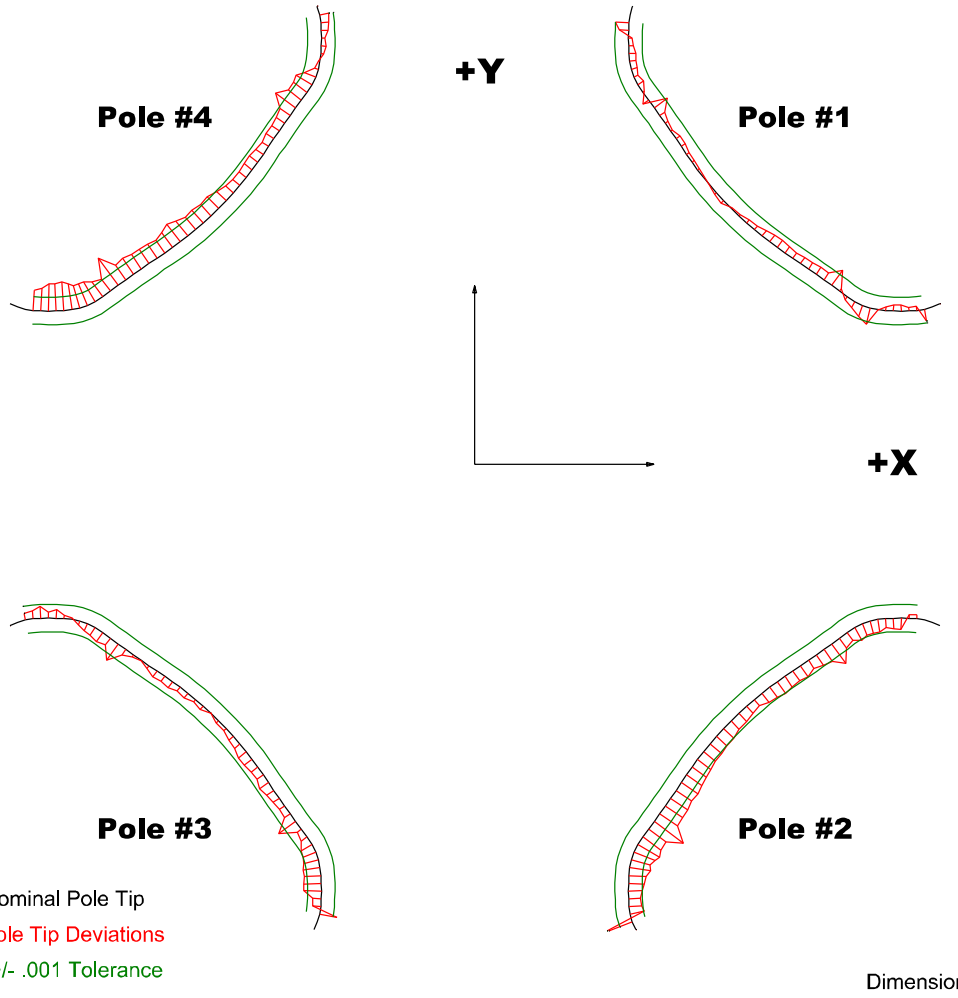
Composite Best-fit of Pole Tips, Upstream



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.	-0.00137	-0.00267	-0.00153	-0.00249
Max. Dev.	0.0012	0.00241	0.00126	0.00067

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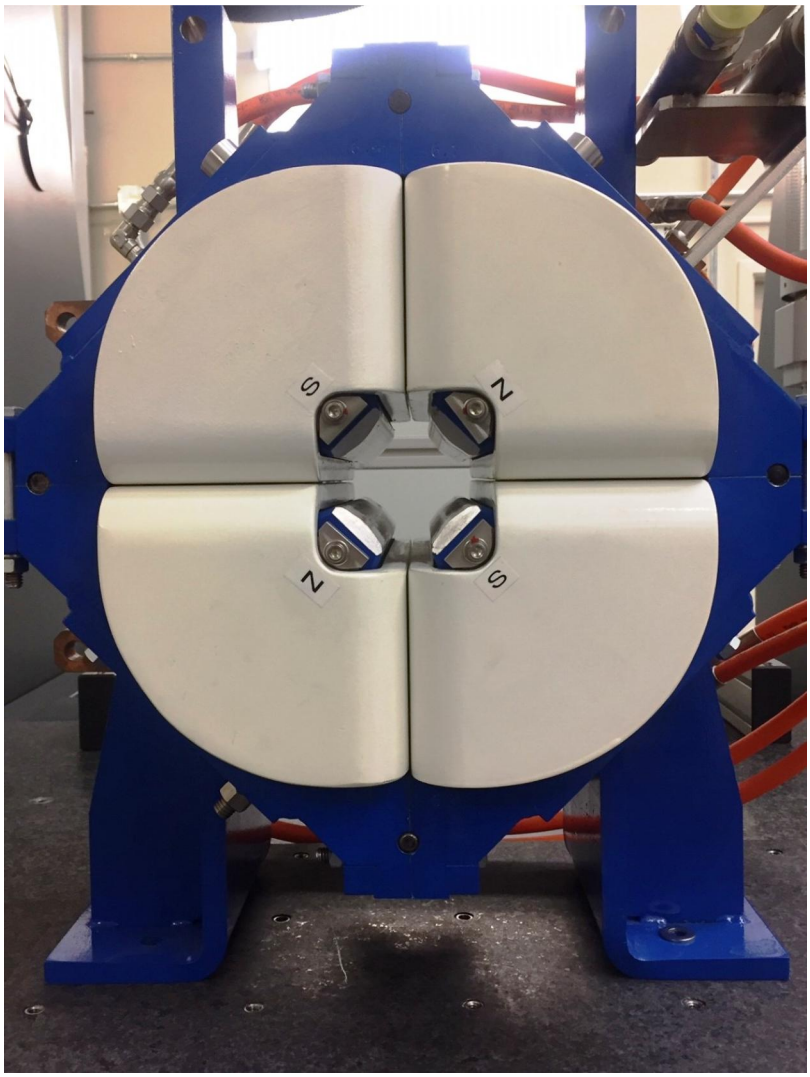
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	-0.01571
Angle in Milliradians :	-0.27415

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