LCLS II 2Q10 Fiducialization Report

Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-30
Barcode # : 4210
Mfg. S/N : MFG SN 02

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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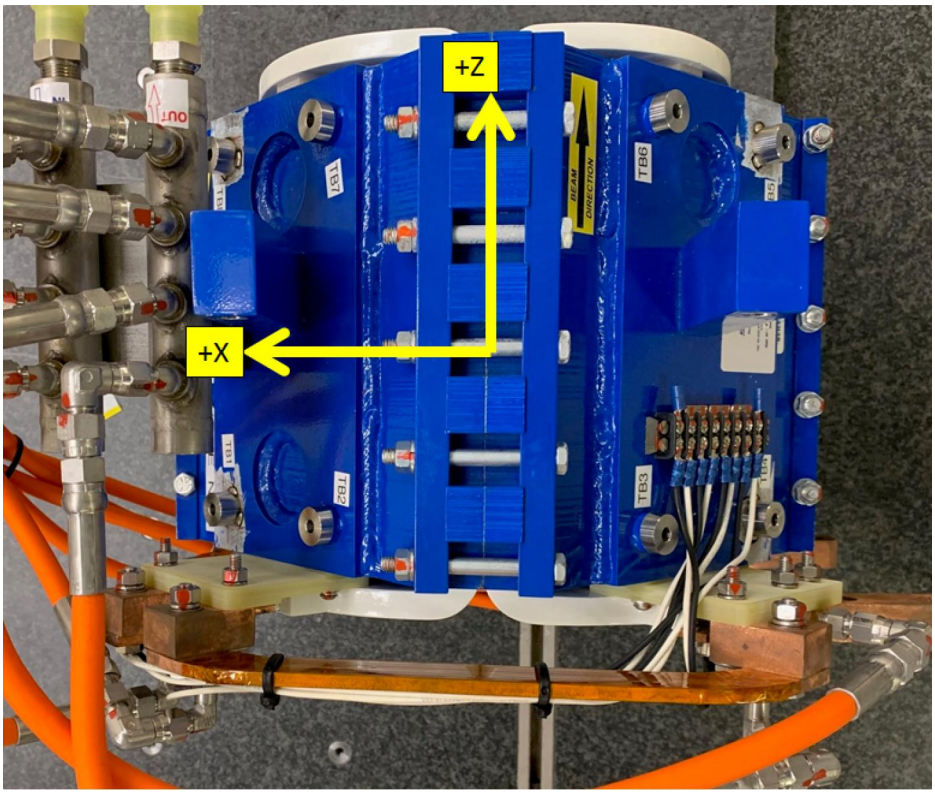
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.5114	3.9911	-3.7203
TB 2	3.9800	6.4678	-3.7351
TB 3	-3.9665	6.4782	-3.7469
TB 4	-6.5130	3.9972	-3.7242
TB 5	-6.4894	4.0216	3.7090
TB 6	-3.9687	6.4799	3.7268
TB 7	3.9719	6.4727	3.7429
TB 8	6.5024	3.9994	3.7324

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

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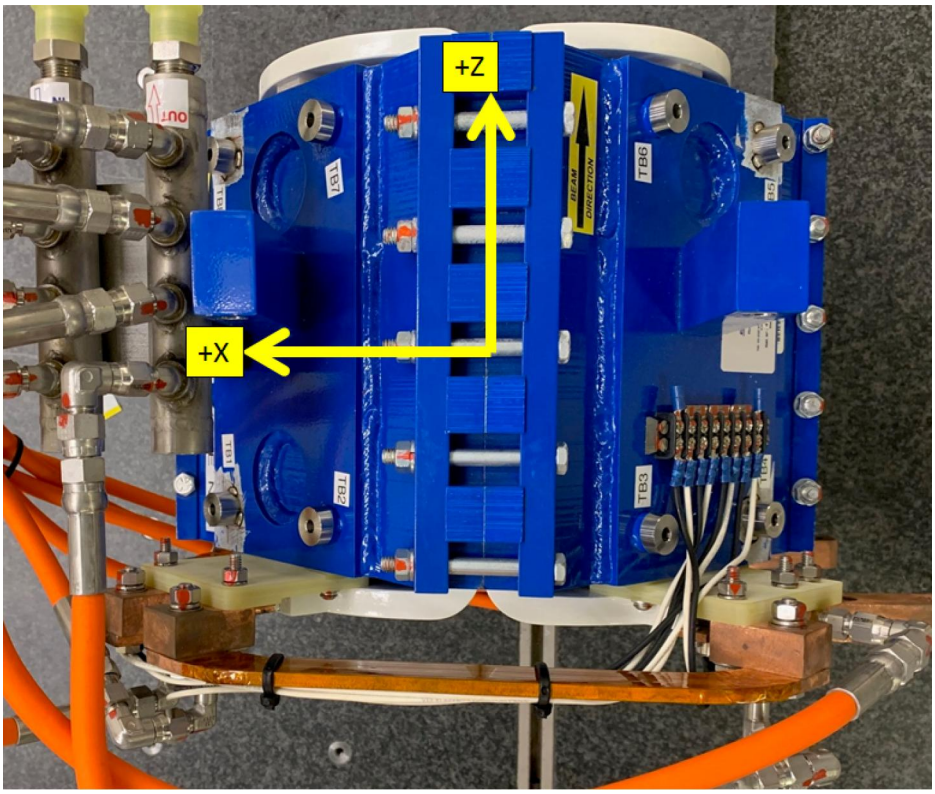

Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.0252	3.5050	-3.7212
TB 2	3.4929	5.9823	-3.7358
TB 3	-3.4811	5.9909	-3.7467
TB 4	-6.0251	3.5124	-3.7252
TB 5	-6.0029	3.5362	3.7110
TB 6	-3.4810	5.9957	3.7259
TB 7	3.4848	5.9885	3.7419
TB 8	6.0159	3.5129	3.7324

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

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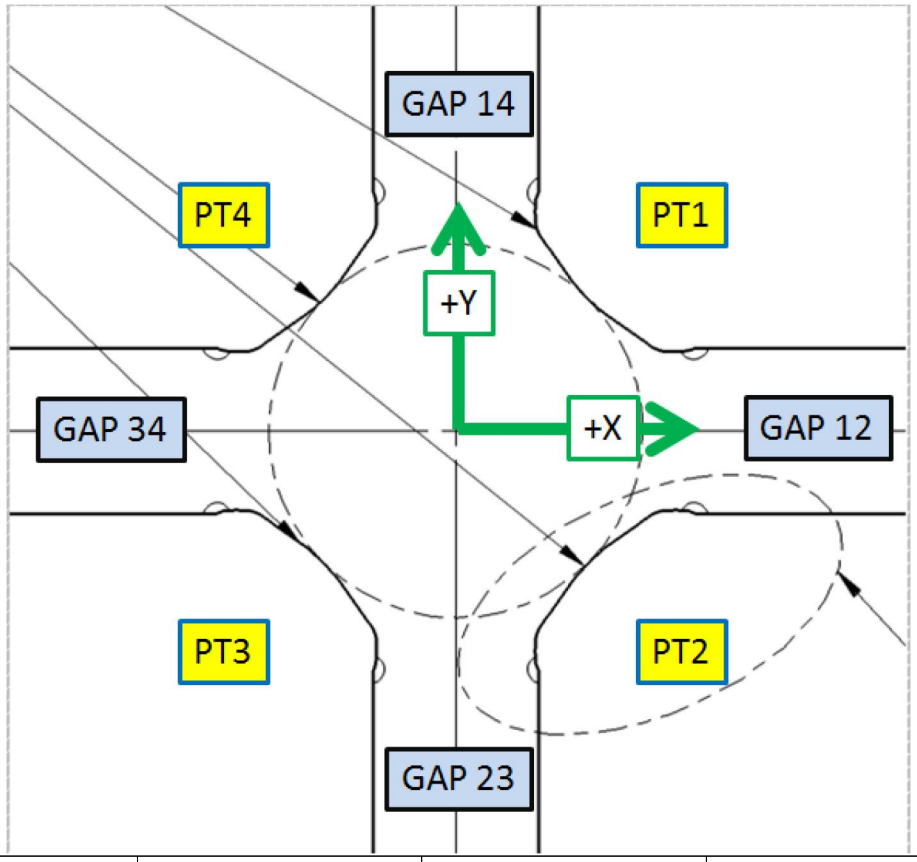
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02737	2.02727
PT Distance 2-4	2.026	2.02768	2.02843
Gap 1-2	0.8602	0.85916	0.85928
Gap 2-3	0.8602	0.86081	0.86096
Gap 3-4	0.8602	0.85543	0.85561
Gap 1-4	0.8602	0.86017	0.85931

Dimensions in Inch

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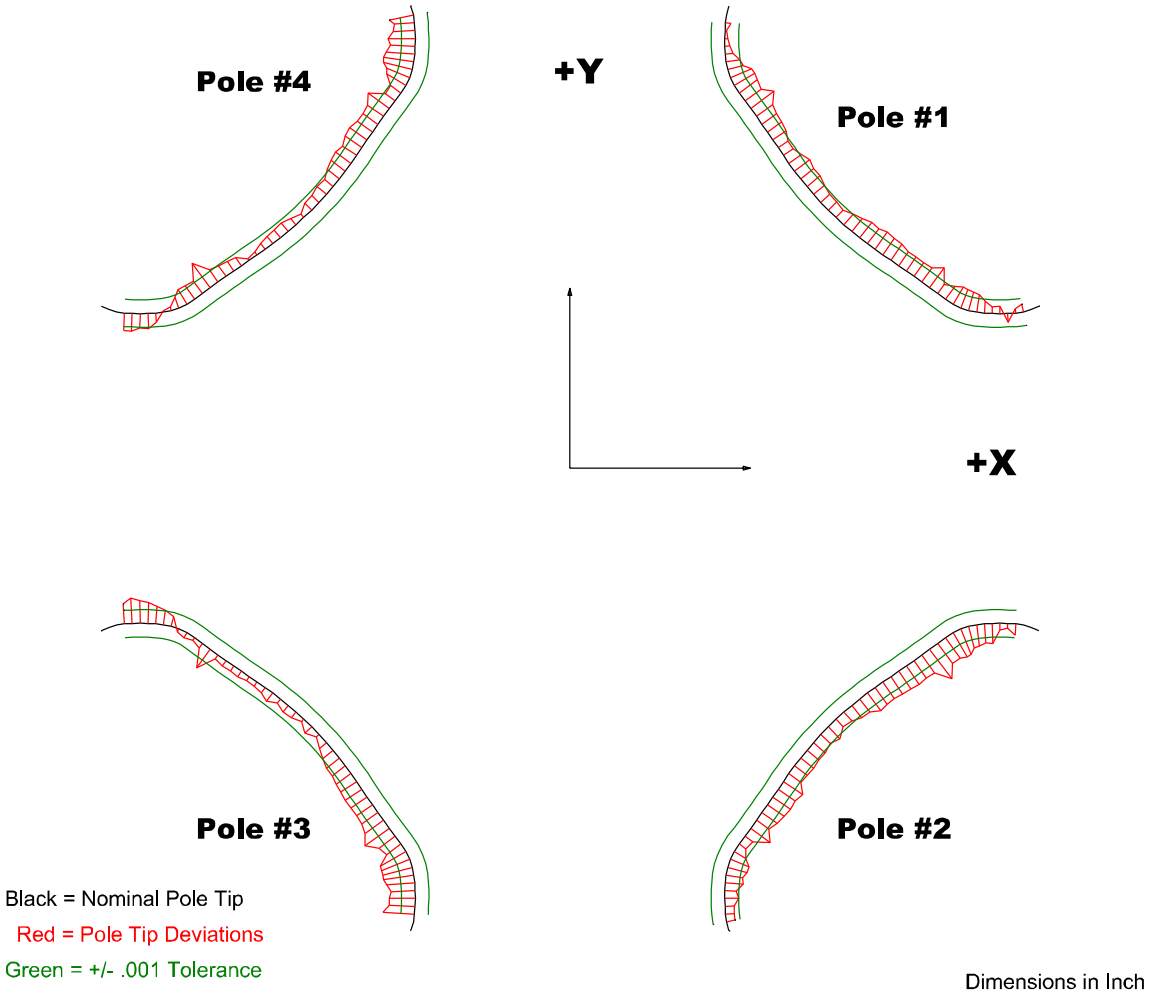
Composite Best-fit of Pole Tips, Downstream



Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00211	-0.00268	-0.00231	-0.00221
Max. Dev.	0.00064	-0.00031	0.00187	0.00129

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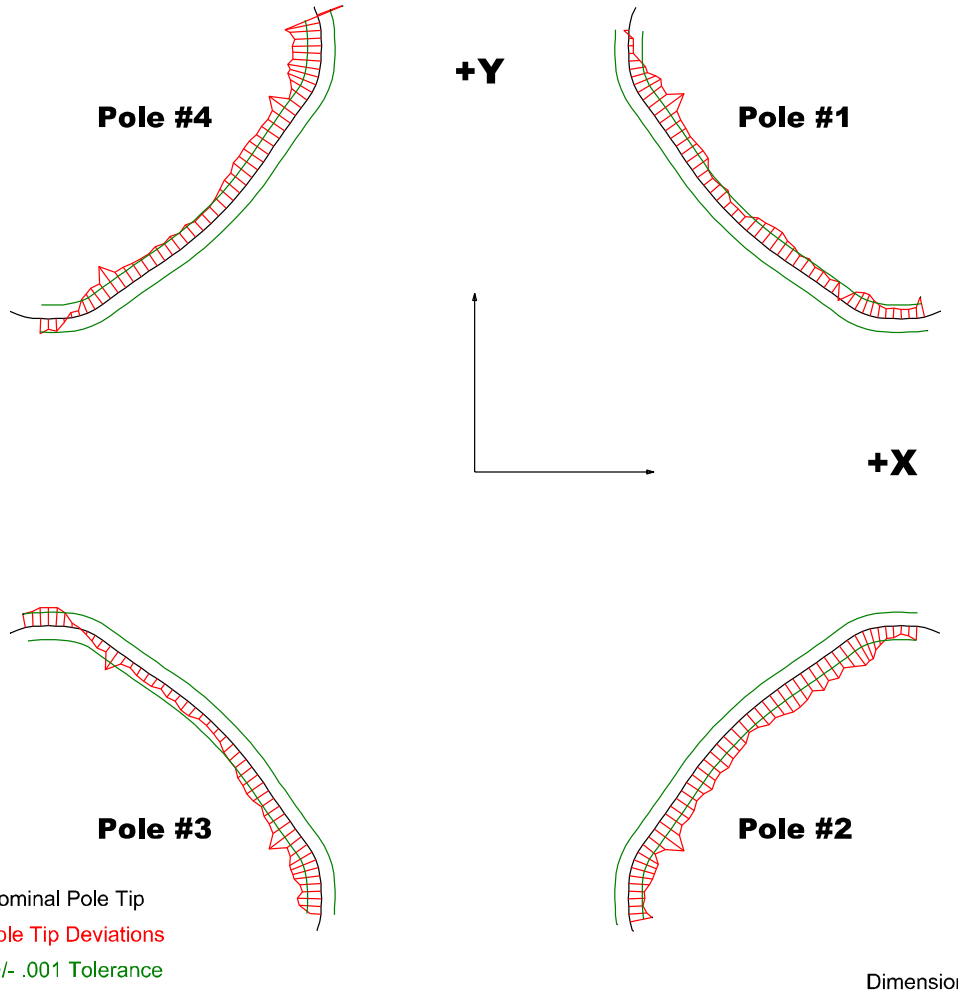
Composite Best-fit of Pole Tips, Upstream



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.	-0.0027	-0.00269	-0.00243	-0.00259
Max. Dev.	0.00037	-0.00057	0.00138	0.0033

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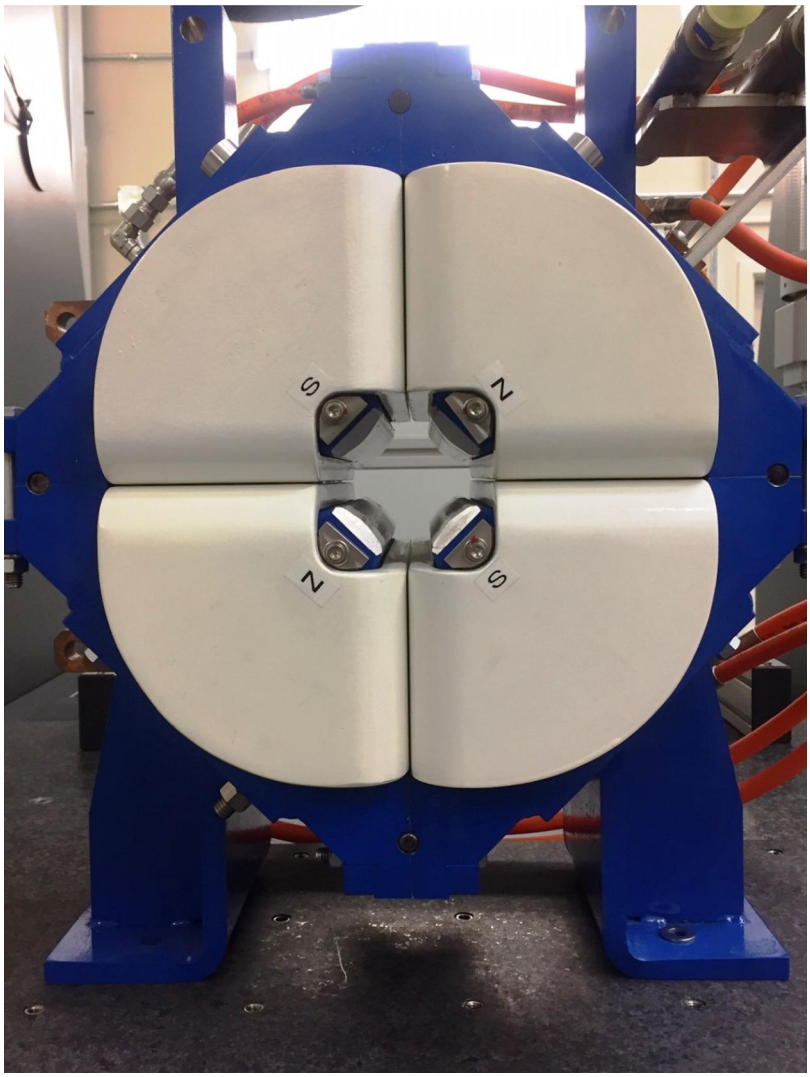
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	0.04836
Angle in Milliradians :	0.84401

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