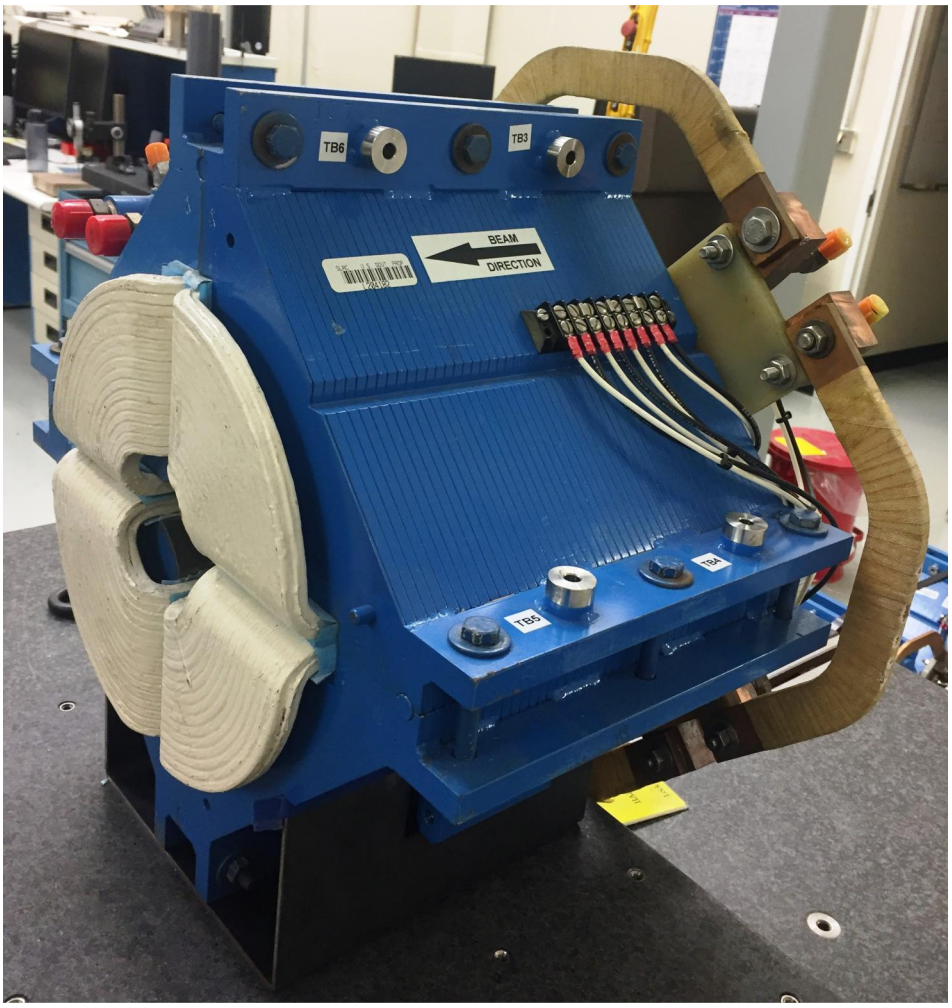
LCLS II 2Q10 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-21
Barcode # : 4205
Mfg. S/N : #14

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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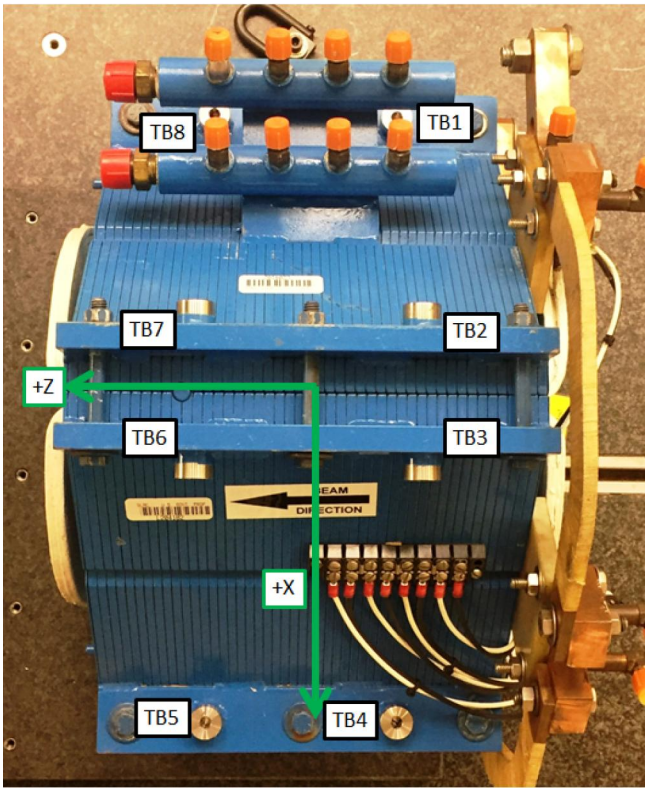
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0791	2.6649	-2.1402
TB 2	-2.6686	7.1273	-2.1596
TB 3	2.6665	7.0520	-2.1726
TB 4	7.0642	2.6635	-2.1894
TB 5	7.0714	2.6726	2.1517
TB 6	2.6854	7.0562	2.1656
TB 7	-2.6615	7.1202	2.1731
TB 8	-7.0602	2.6707	2.1860

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

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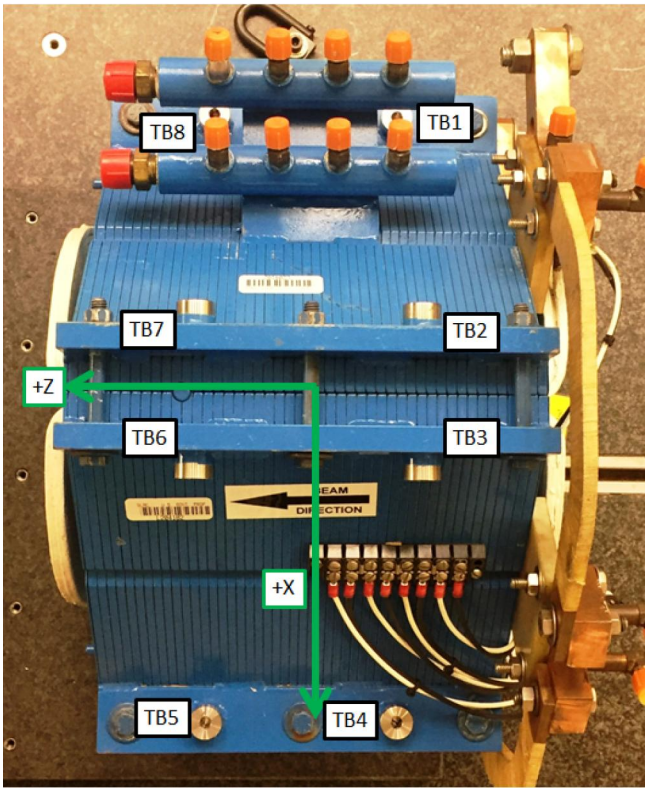
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0719	1.9778	-2.1410
TB 2	-1.9812	7.0979	-2.1620
TB 3	1.9784	7.0507	-2.1702
TB 4	7.0565	1.9761	-2.1880
TB 5	7.0646	1.9853	2.1537
TB 6	1.9934	7.0575	2.1677
TB 7	-1.9745	7.0921	2.1738
TB 8	-7.0553	1.9834	2.1876

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

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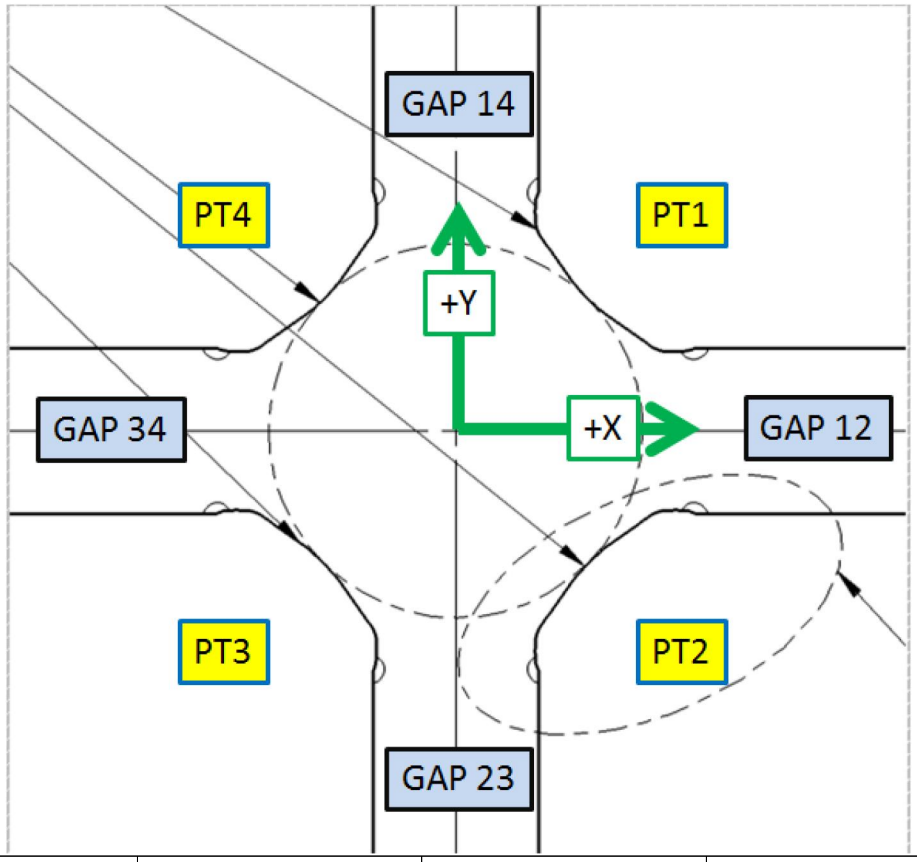
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02551	2.02537
PT Distance 2-4	2.026	2.02576	2.02687
Gap 1-2	0.8602	0.85427	0.85663
Gap 2-3	0.8602	0.85955	0.86063
Gap 3-4	0.8602	0.85524	0.8559
Gap 1-4	0.8602	0.86065	0.85941

Dimensions in Inch

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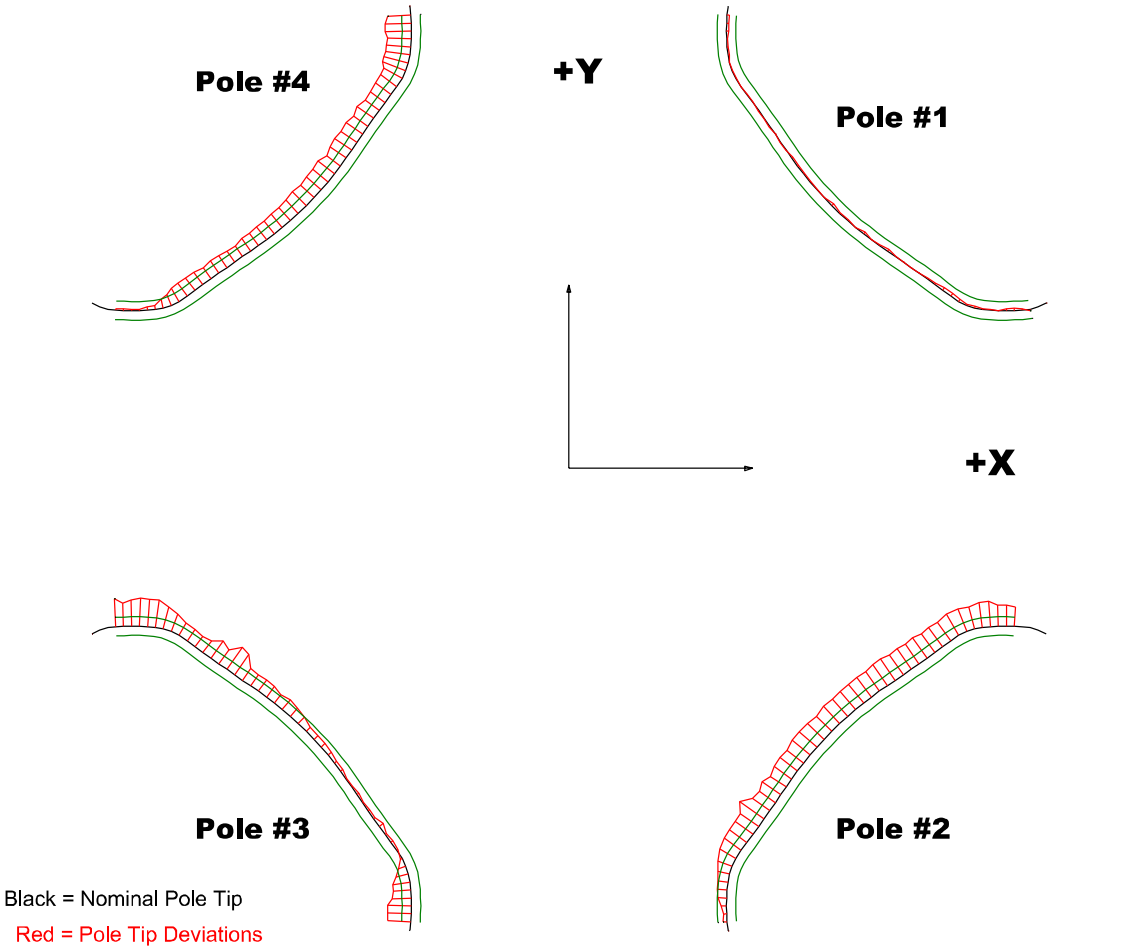
Composite Best-fit of Pole Tips, Downstream



Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00035	0.00031	-0.00257	-0.00283
Max. Dev.	0.00016	0.0032	0.00303	-0.00012

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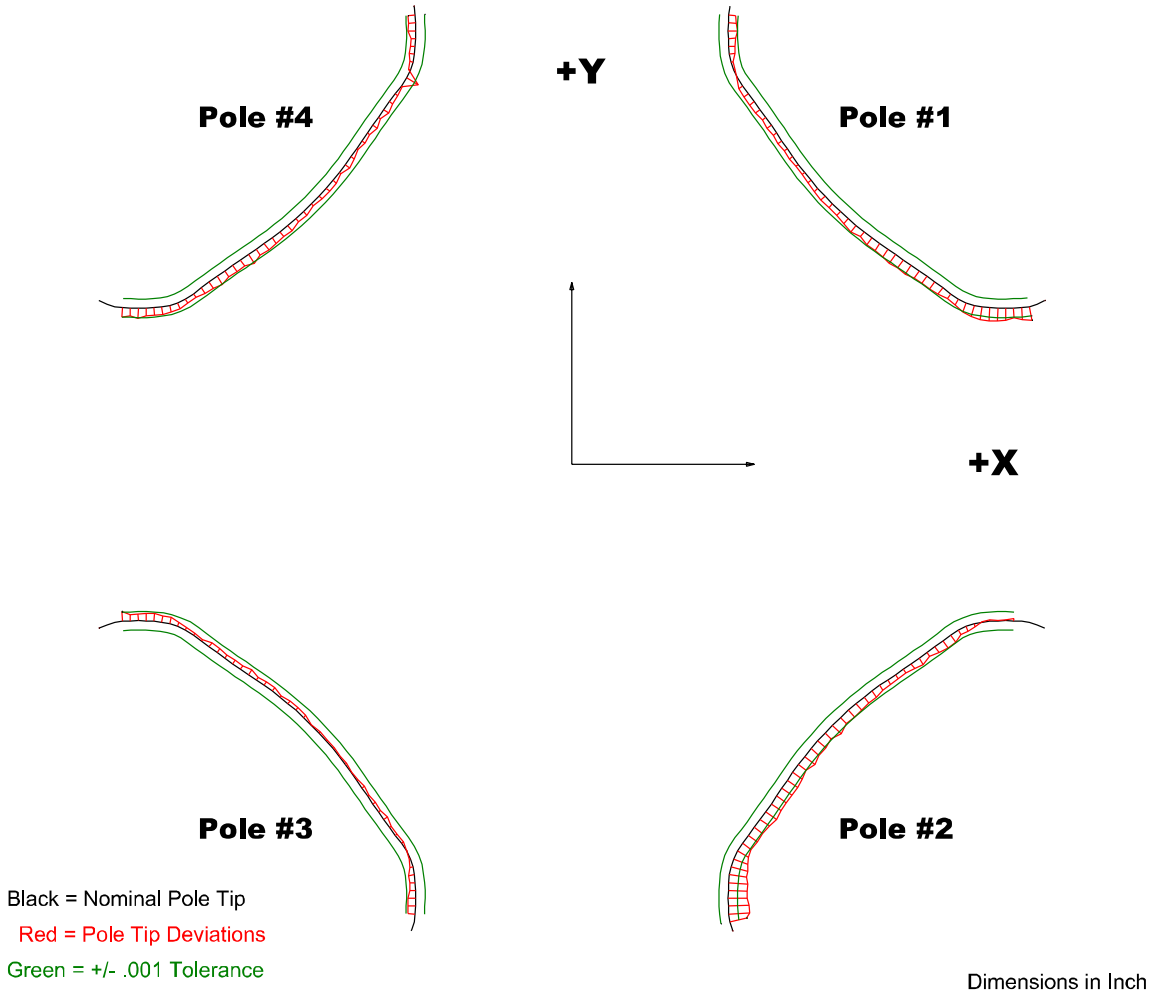
Composite Best-fit of Pole Tips, Upstream



Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00105	-0.00225	-0.00084	-0.00089
Max. Dev.	0.00148	0.0003	0.00107	0.00142

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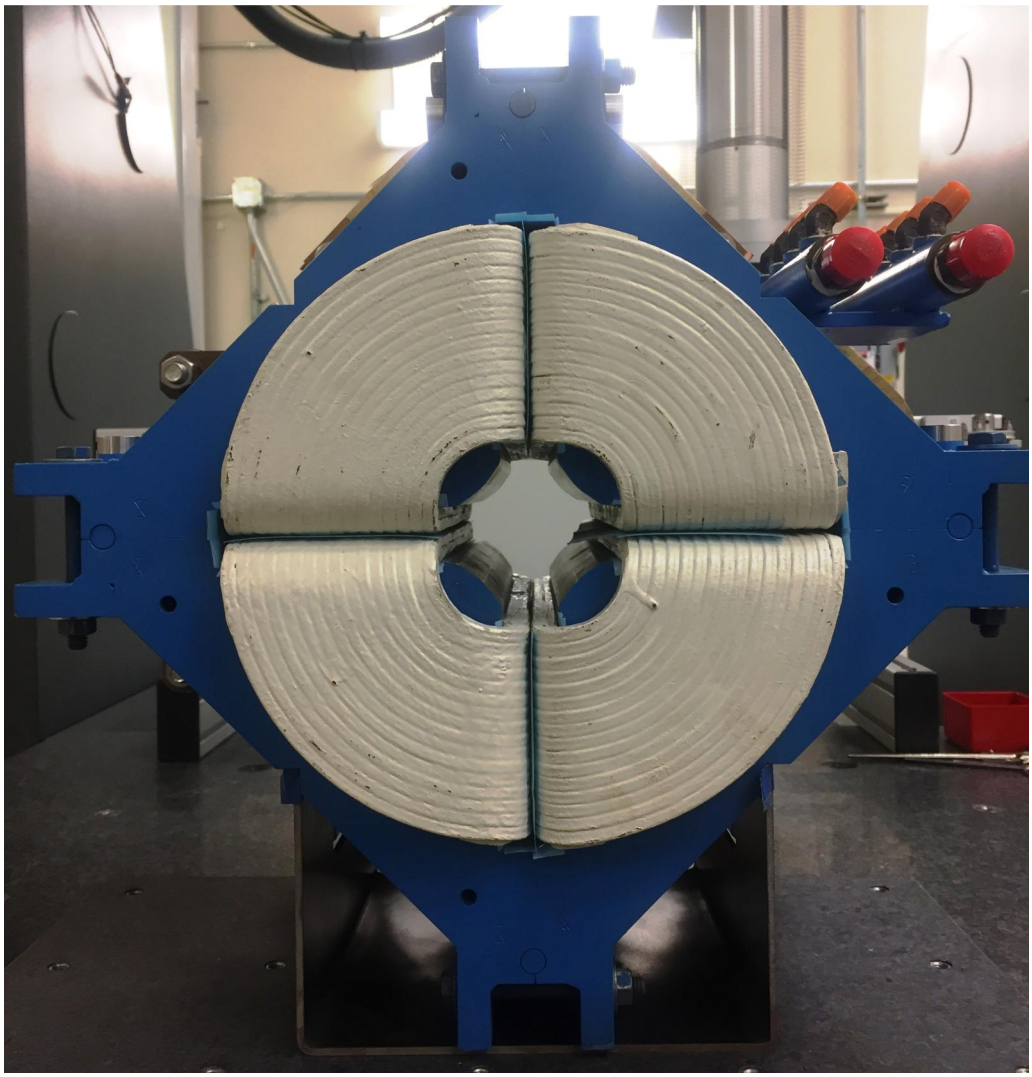
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	0.01176
Angle in Milliradians :	0.20526

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