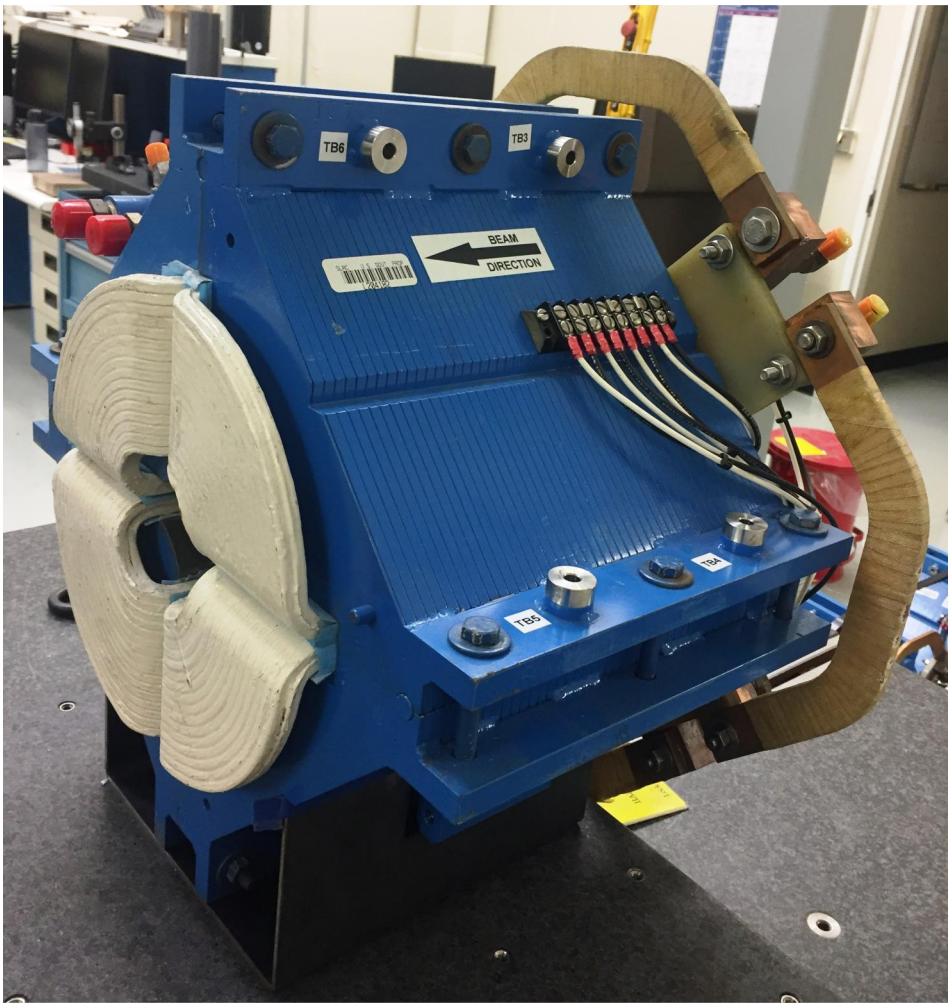
LCLS II 2Q10 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-21
Barcode # : 4207
Mfg. S/N : #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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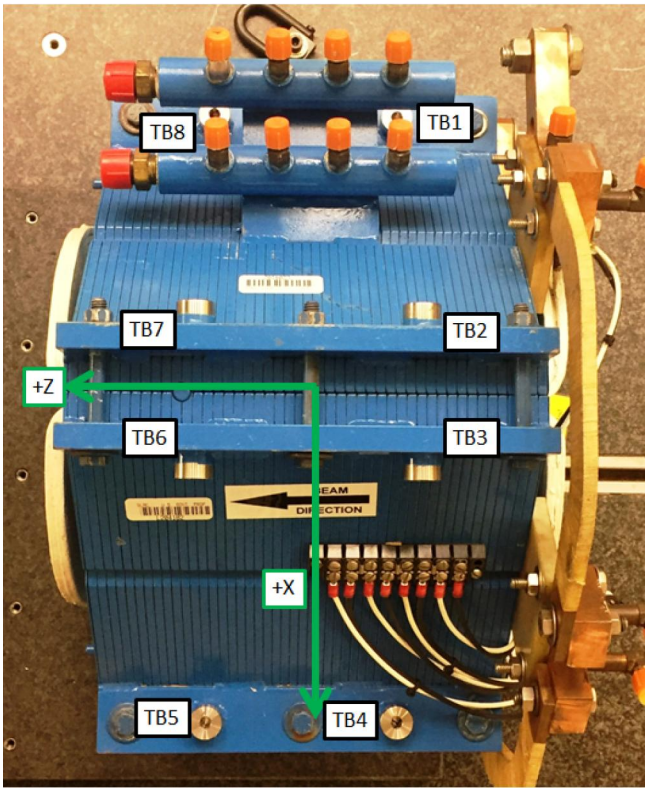
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0429	2.6797	-2.1617
TB 2	-2.6689	7.0505	-2.1785
TB 3	2.6863	7.0475	-2.1540
TB 4	7.0779	2.6655	-2.1686
TB 5	7.0607	2.6696	2.1729
TB 6	2.6778	7.0521	2.1653
TB 7	-2.6702	7.0437	2.1555
TB 8	-7.0485	2.6739	2.1579

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

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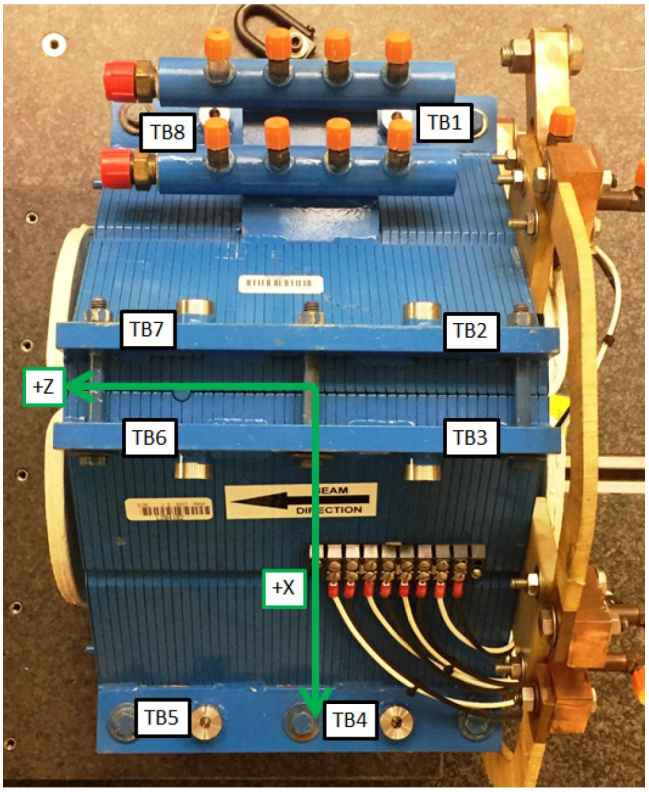
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0412	1.9921	-2.1627
TB 2	-1.9807	7.0485	-2.1798
TB 3	1.9991	7.0477	-2.1564
TB 4	7.0693	1.9782	-2.1679
TB 5	7.0549	1.9820	2.1746
TB 6	1.9895	7.0530	2.1647
TB 7	-1.9826	7.0411	2.1557
TB 8	-7.0481	1.9866	2.1575

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

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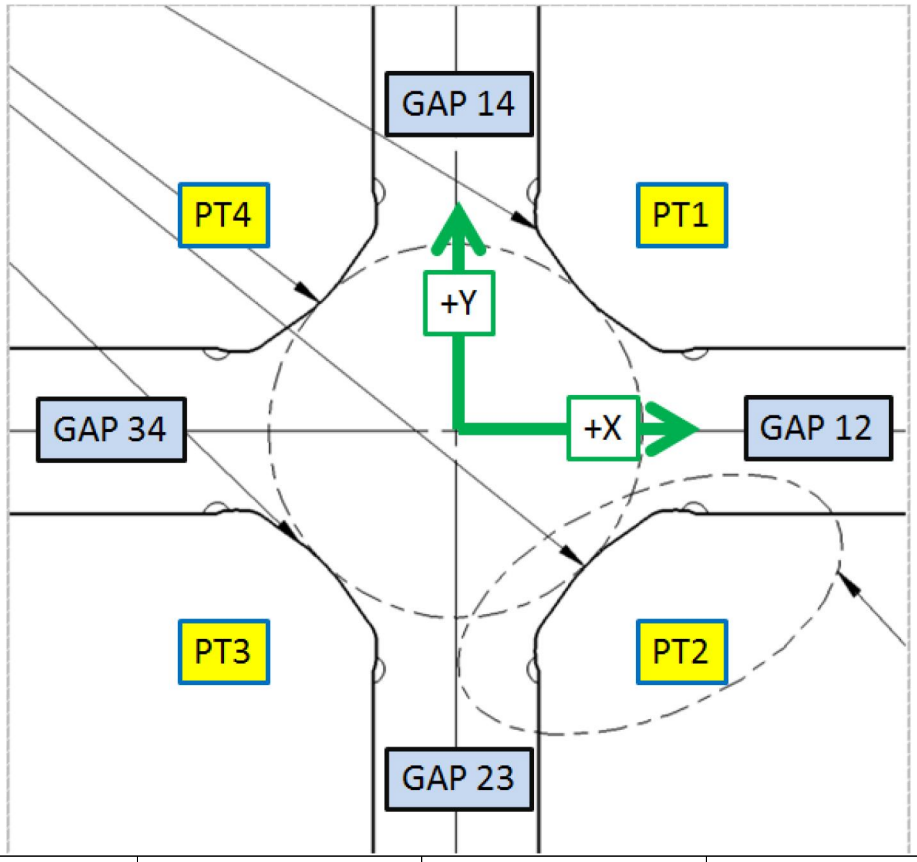
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02756	2.03088
PT Distance 2-4	2.026	2.02662	2.02688
Gap 1-2	0.8602	0.85902	0.85656
Gap 2-3	0.8602	0.86087	0.86169
Gap 3-4	0.8602	0.85635	0.85418
Gap 1-4	0.8602	0.86331	0.86322

Dimensions in Inch

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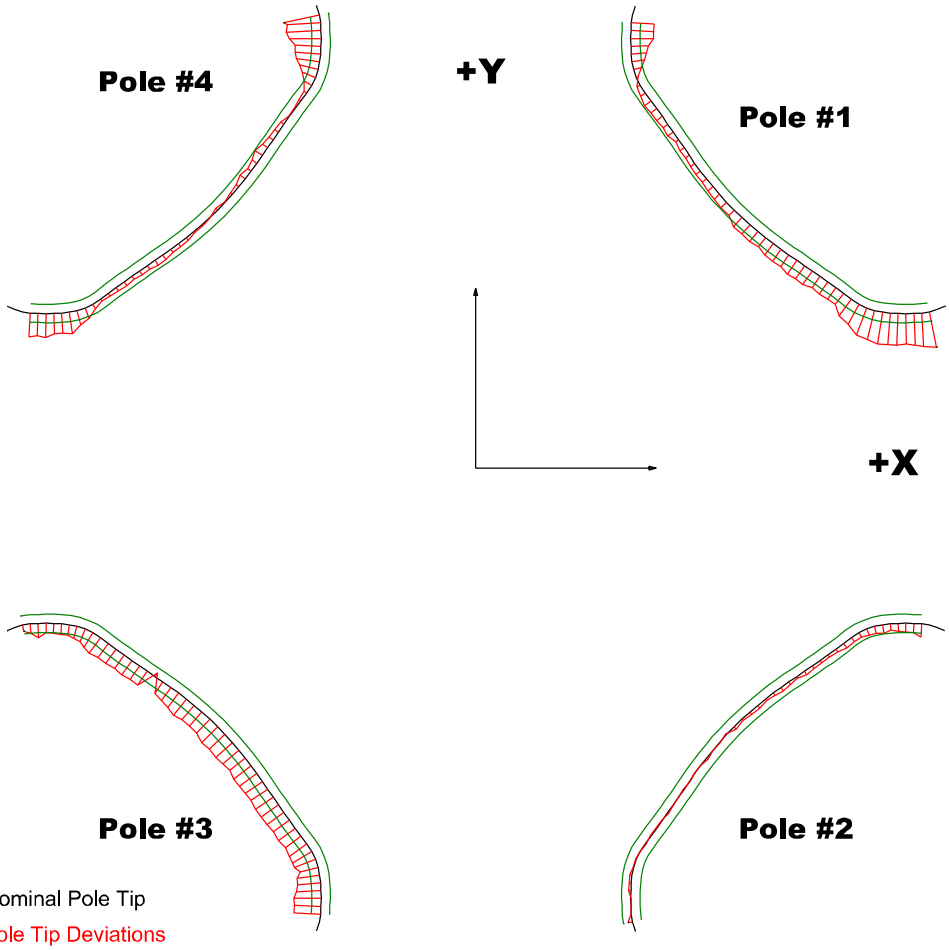
Composite Best-fit of Pole Tips, Downstream



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.	-0.00251	-0.00146	-0.00301	-0.00399
Max. Dev.	0.00394	0.00051	0.00047	0.00261

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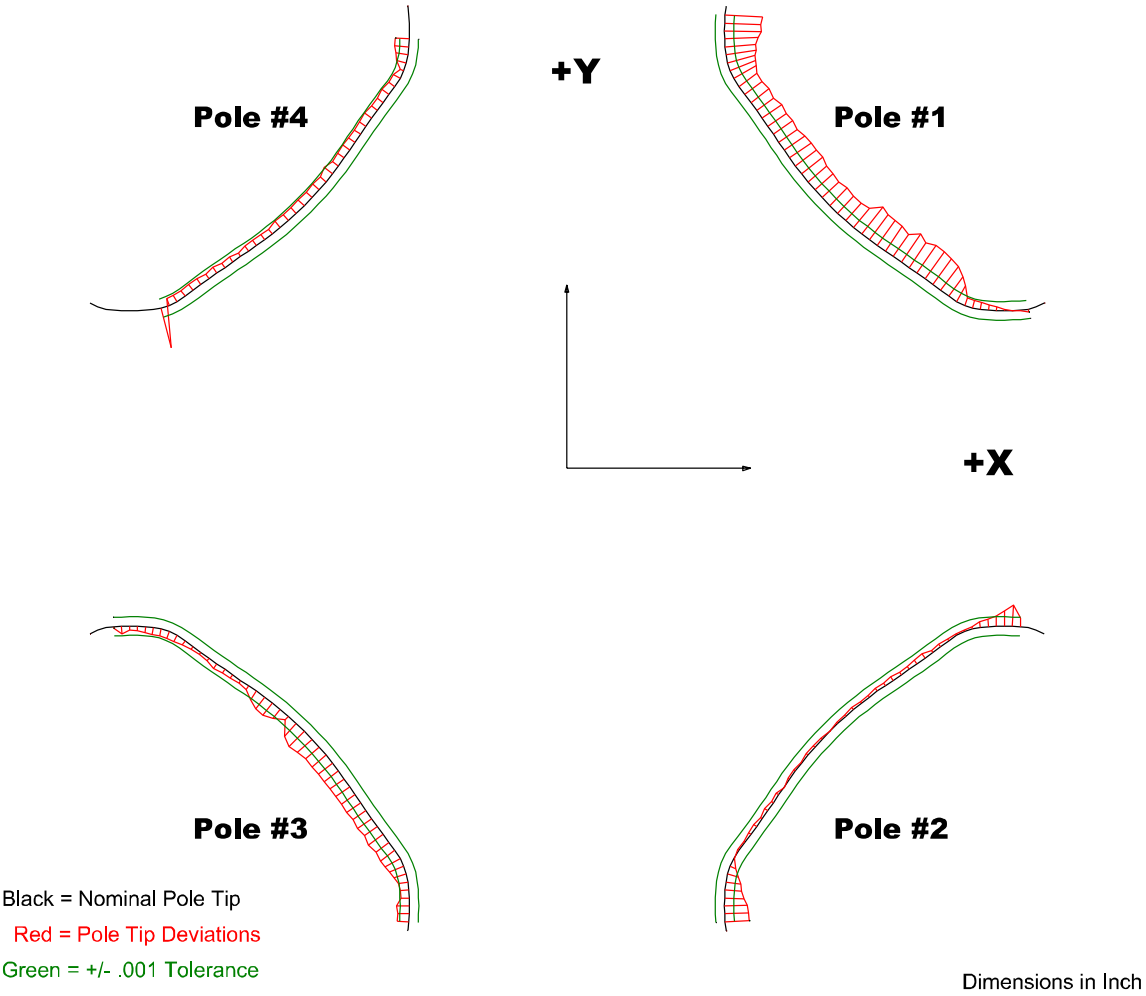
Composite Best-fit of Pole Tips, Upstream



Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00401	-0.0026	-0.0023	-0.00154
Max. Dev.	0.00028	0.00229	-0.00013	0.00441

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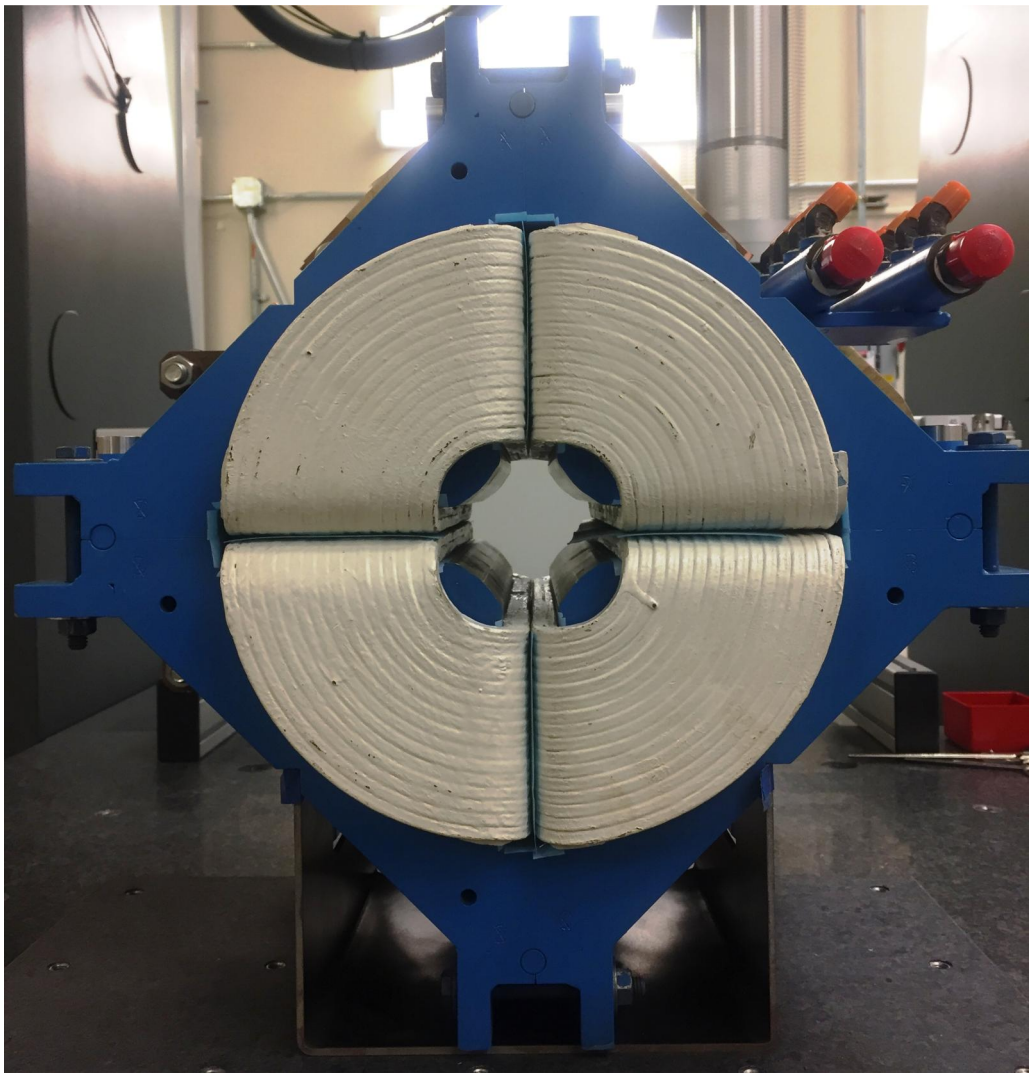
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	0.10518
Angle in Milliradians :	1.83582

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