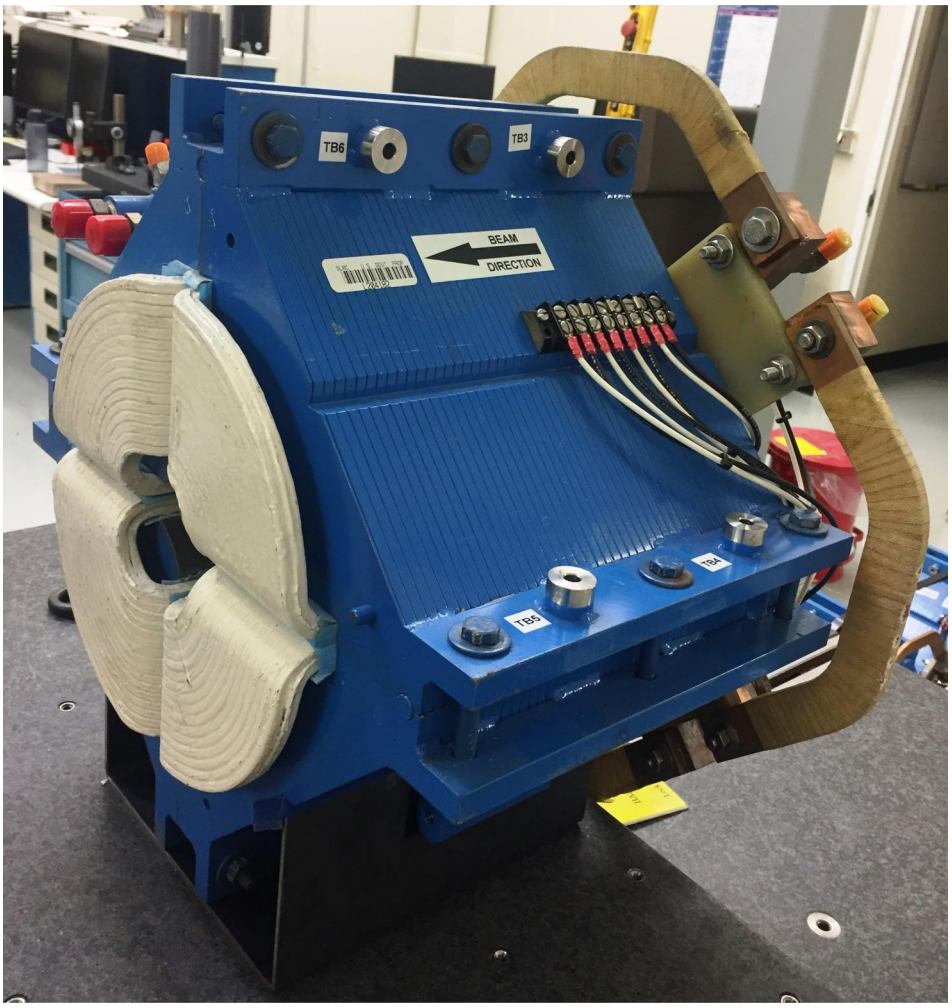
LCLS II 2Q10 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-21
Barcode # : 4194
Mfg. S/N : #01

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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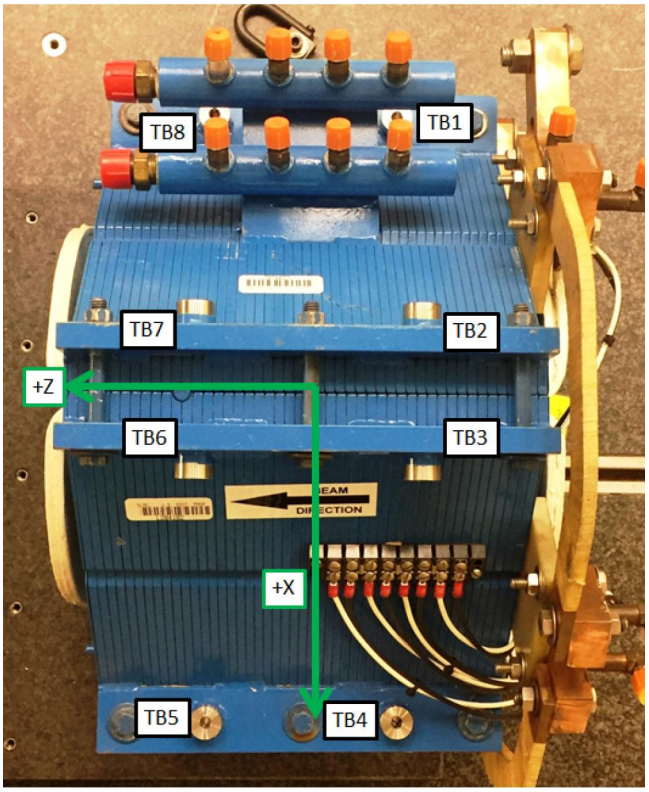
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0546	2.6824	-2.1447
TB 2	-2.6860	7.0553	-2.1568
TB 3	2.6717	7.0534	-2.1769
TB 4	7.0471	2.6783	-2.1781
TB 5	7.0668	2.6761	2.1412
TB 6	2.6790	7.0592	2.1524
TB 7	-2.6697	7.0600	2.1694
TB 8	-7.0595	2.6799	2.1755

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

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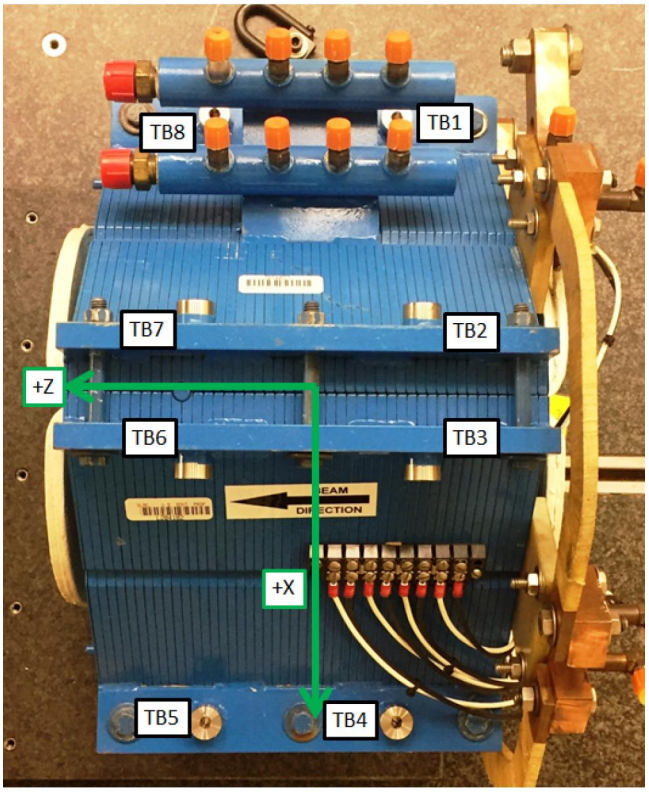
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0598	1.9950	-2.1447
TB 2	-1.9985	7.0569	-2.1608
TB 3	1.9812	7.0546	-2.1746
TB 4	7.0477	1.9899	-2.1798
TB 5	7.0650	1.9889	2.1408
TB 6	1.9904	7.0578	2.1562
TB 7	-1.9828	7.0588	2.1686
TB 8	-7.0596	1.9928	2.1740

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

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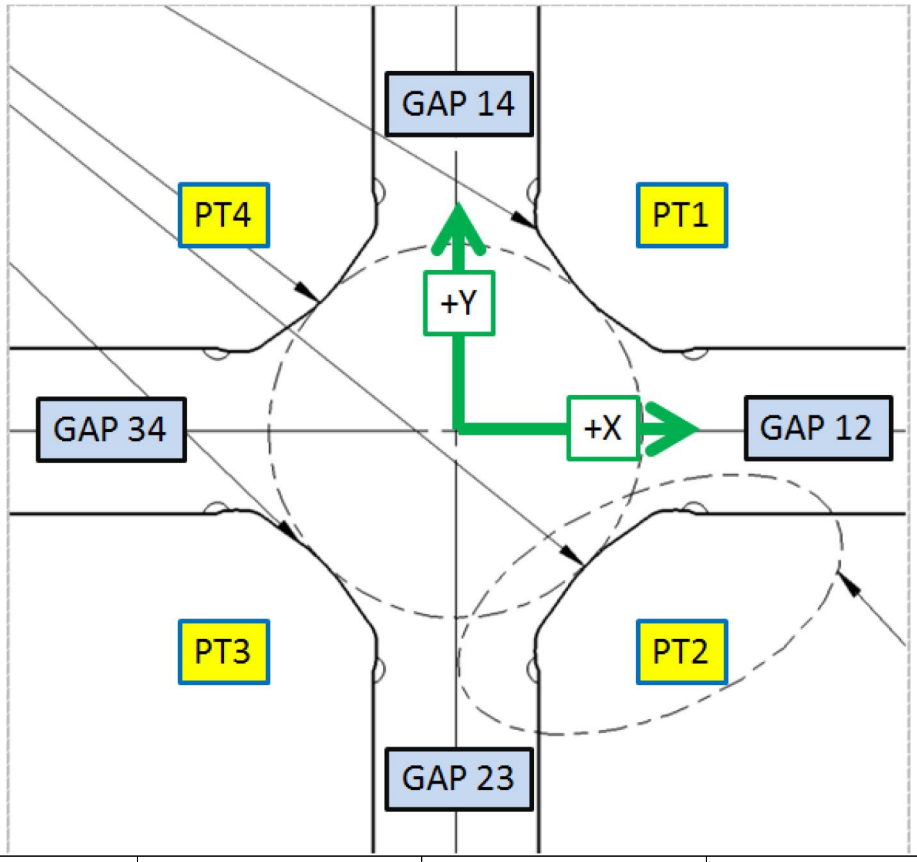
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02652	2.02624
PT Distance 2-4	2.026	2.02622	2.02615
Gap 1-2	0.8602	0.85777	0.85815
Gap 2-3	0.8602	0.85808	0.85853
Gap 3-4	0.8602	0.85793	0.85803
Gap 1-4	0.8602	0.85833	0.85796

Dimensions in Inch

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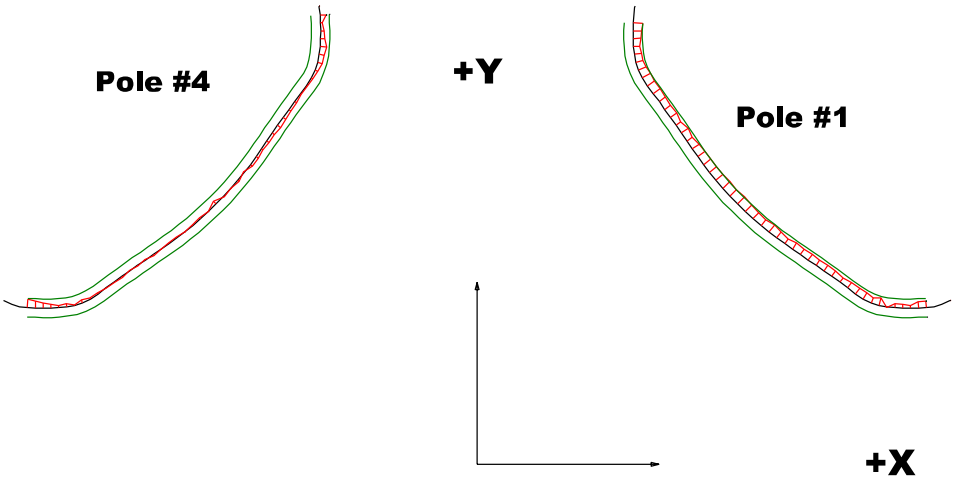
Composite Best-fit of Pole Tips, Downstream



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.	-0.00112	-0.00052	-0.00038	-0.0009
Max. Dev.	0.00009	0.00058	0.001	0.00073

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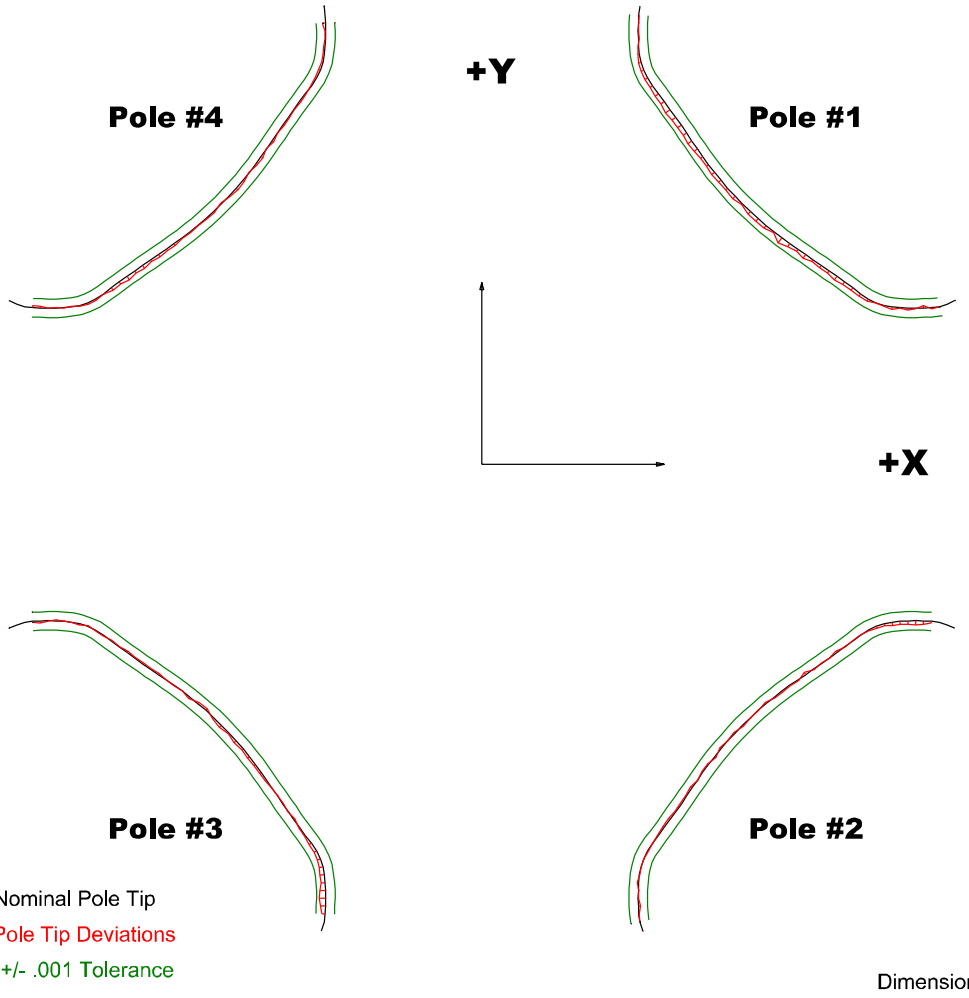
Composite Best-fit of Pole Tips, Upstream



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.	-0.00028	-0.00047	-0.0007	-0.00033
Max. Dev.	0.00063	0.00029	0.00027	0.00045

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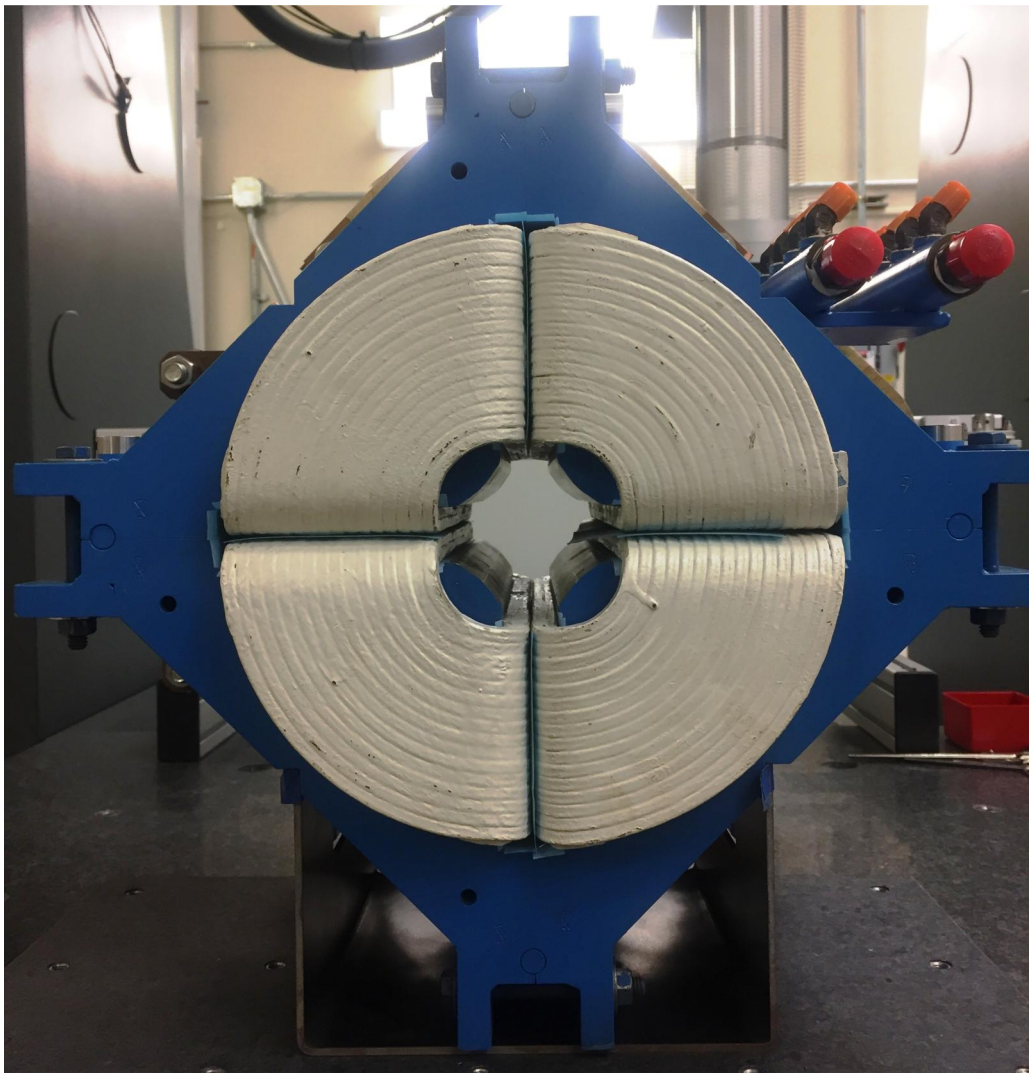
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	0.03461
Angle in Milliradians :	0.60401

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