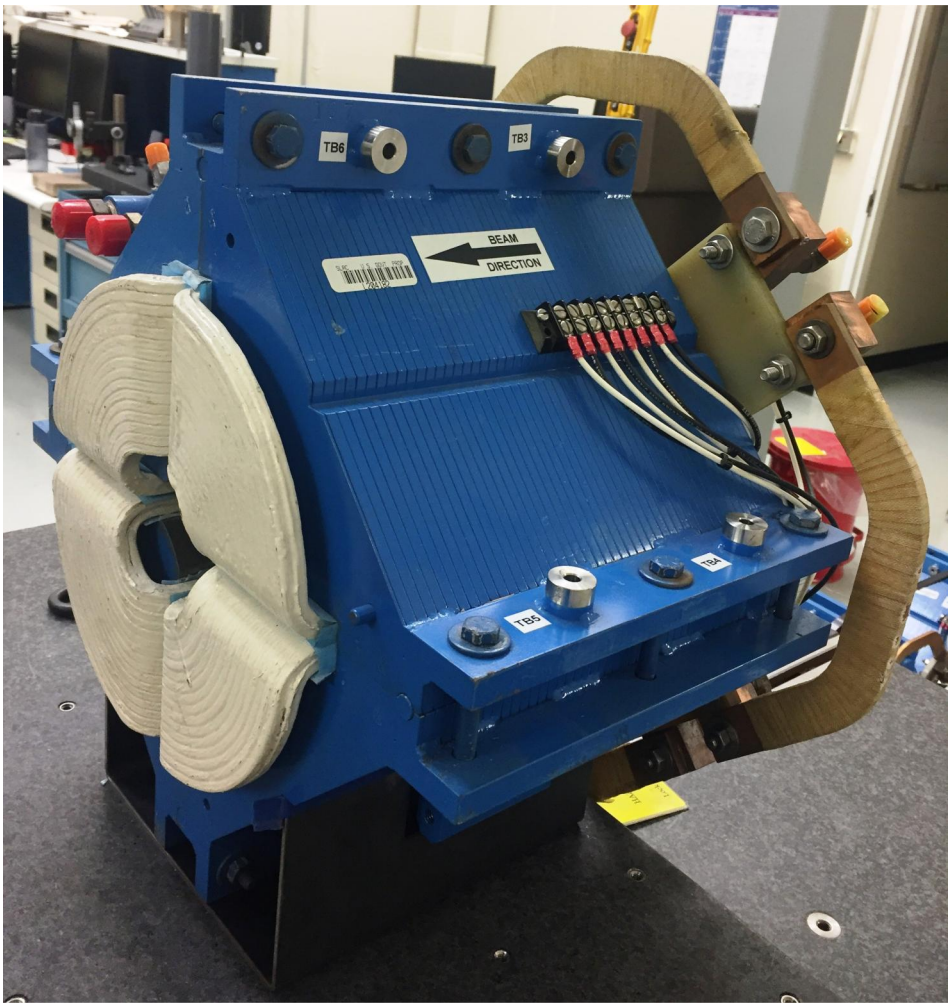
LCLS II 2Q10 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-21
Barcode # : 4199
Mfg. S/N : #17

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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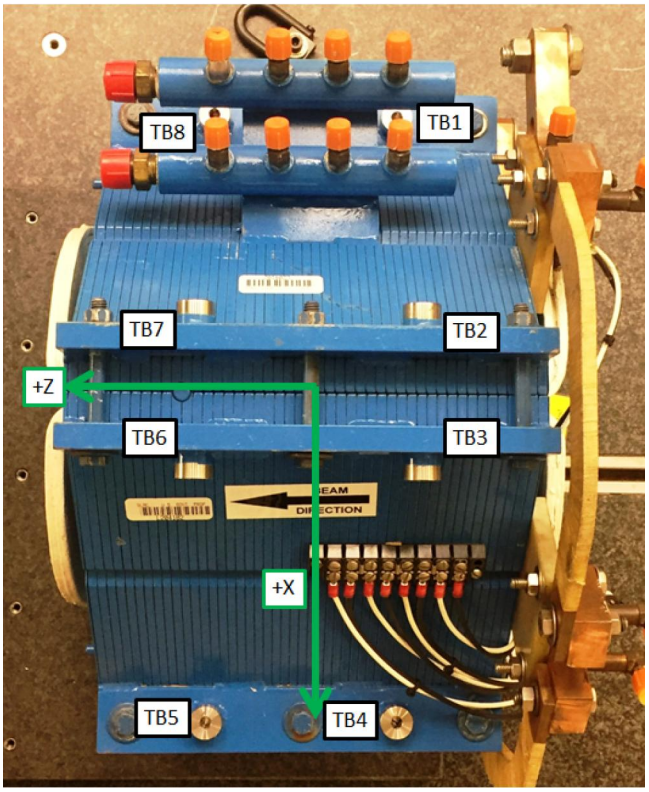
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0589	2.6845	-2.1454
TB 2	-2.6838	7.0690	-2.1651
TB 3	2.6711	7.0527	-2.1675
TB 4	7.0535	2.6695	-2.1793
TB 5	7.0680	2.6682	2.1469
TB 6	2.6776	7.0541	2.1651
TB 7	-2.6697	7.0693	2.1787
TB 8	-7.0503	2.6776	2.1805

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

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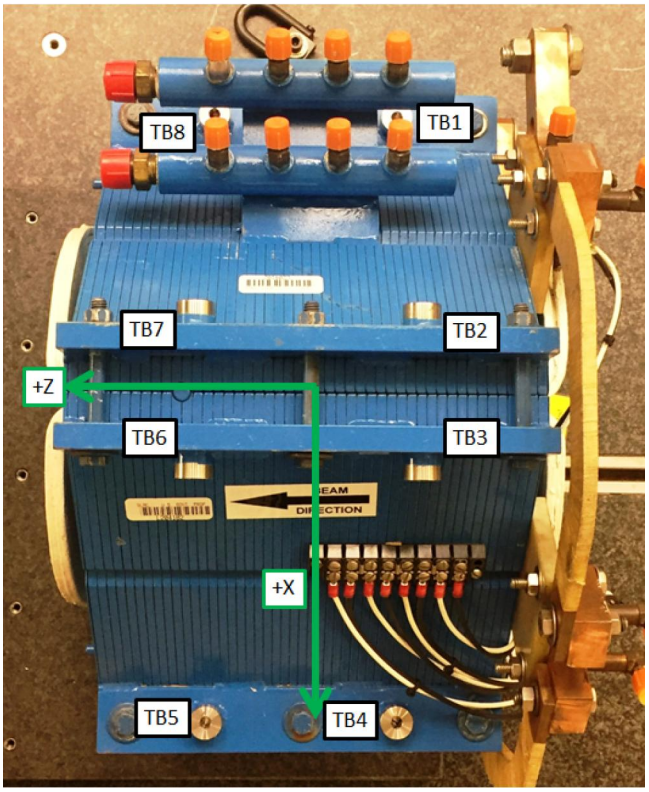
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0564	1.9979	-2.1475
TB 2	-1.9959	7.0701	-2.1692
TB 3	1.9830	7.0540	-2.1681
TB 4	7.0487	1.9814	-2.1784
TB 5	7.0656	1.9809	2.1478
TB 6	1.9904	7.0544	2.1681
TB 7	-1.9821	7.0686	2.1738
TB 8	-7.0487	1.9907	2.1797

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

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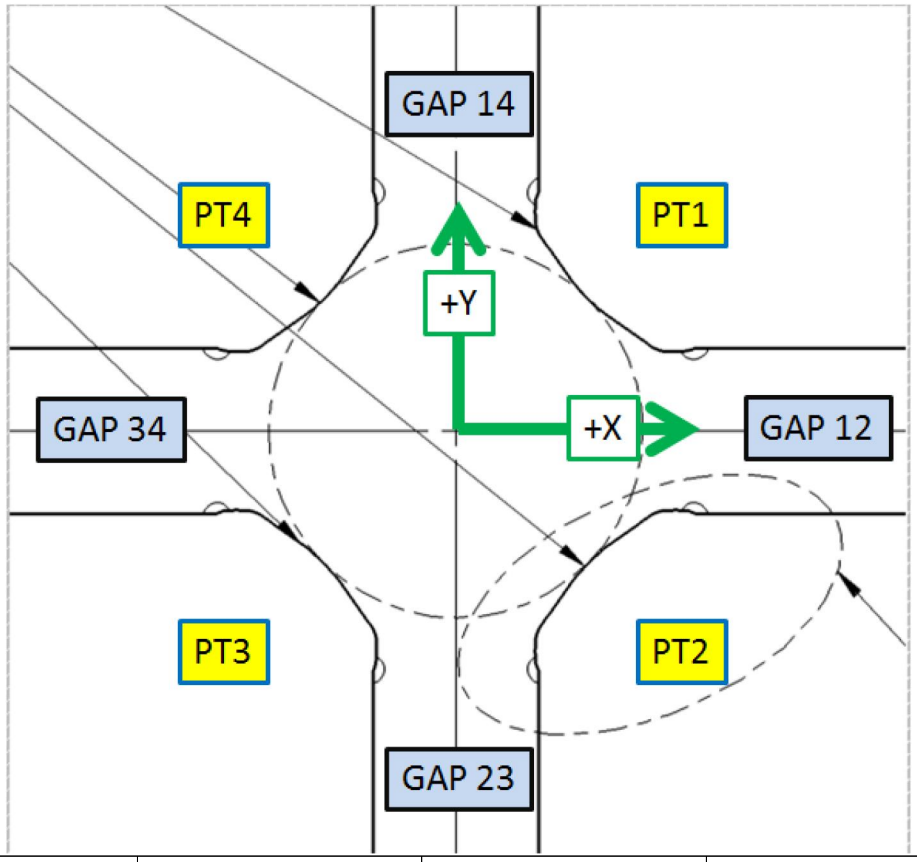
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02605	2.02578
PT Distance 2-4	2.026	2.02521	2.02566
Gap 1-2	0.8602	0.86	0.86055
Gap 2-3	0.8602	0.858	0.85612
Gap 3-4	0.8602	0.85847	0.85997
Gap 1-4	0.8602	0.85792	0.85664

Dimensions in Inch

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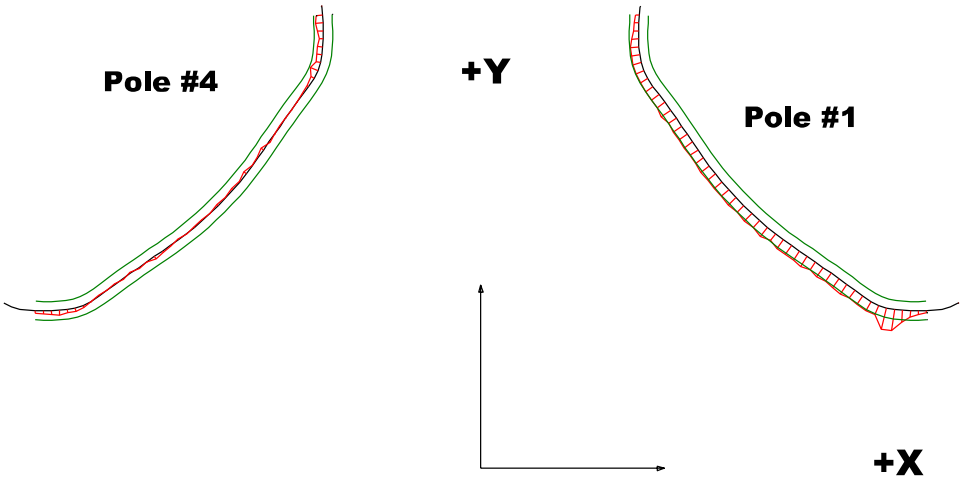
Composite Best-fit of Pole Tips, Downstream



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.	0.00021	-0.00021	-0.00122	-0.00088
Max. Dev.	0.00236	0.00137	-0.00055	0.00053

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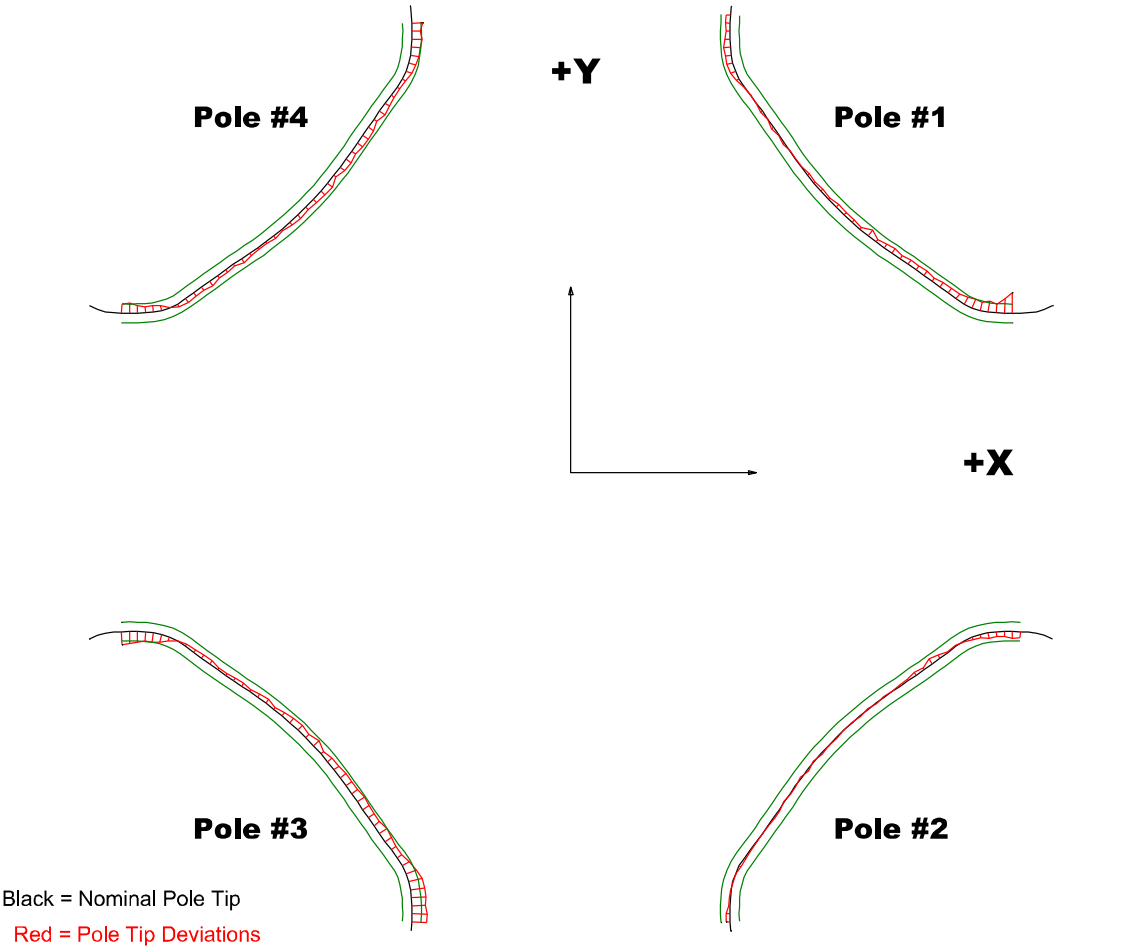
Composite Best-fit of Pole Tips, Upstream



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.	-0.00223	-0.00076	-0.0014	-0.00109
Max. Dev.	0.00071	0.00063	0.00162	0.00118

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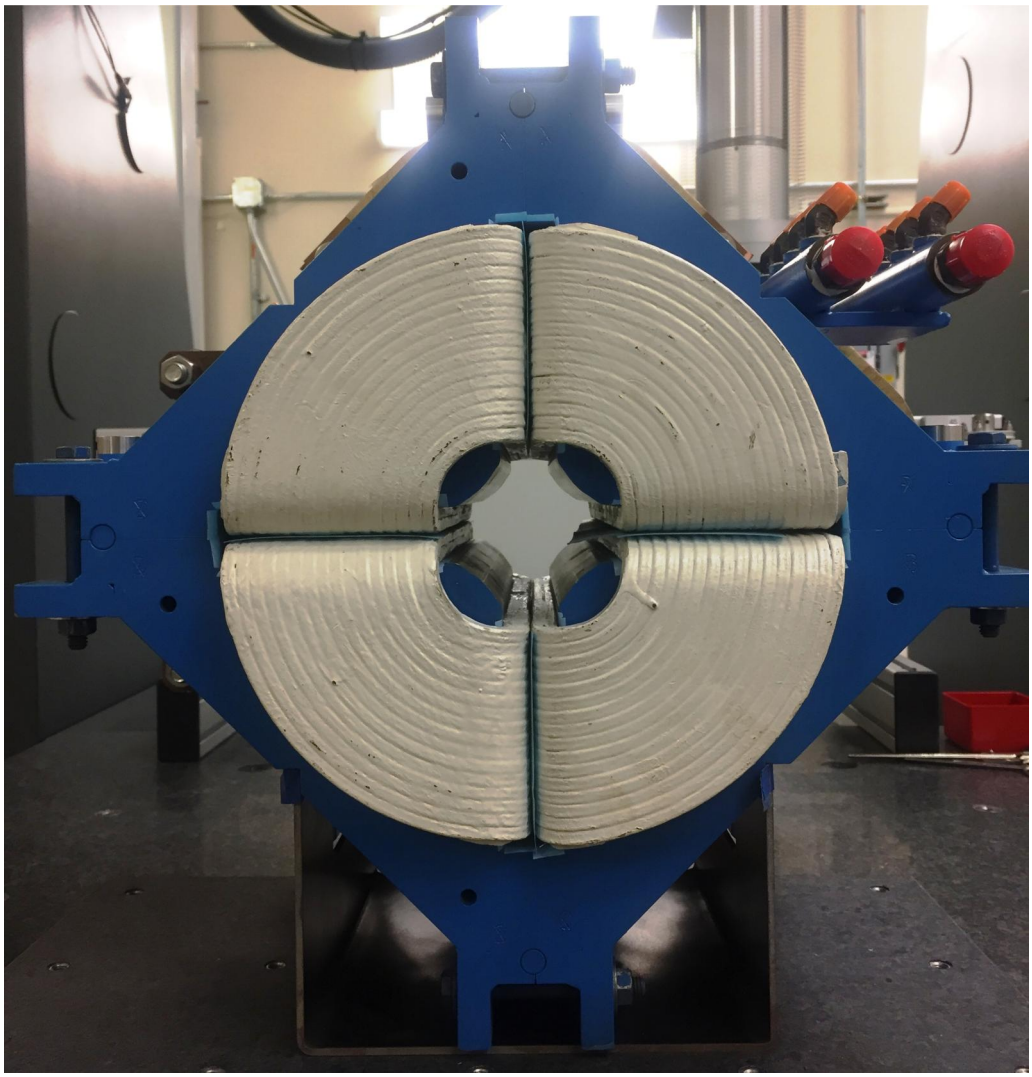
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	0.09137
Angle in Milliradians :	1.59464

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