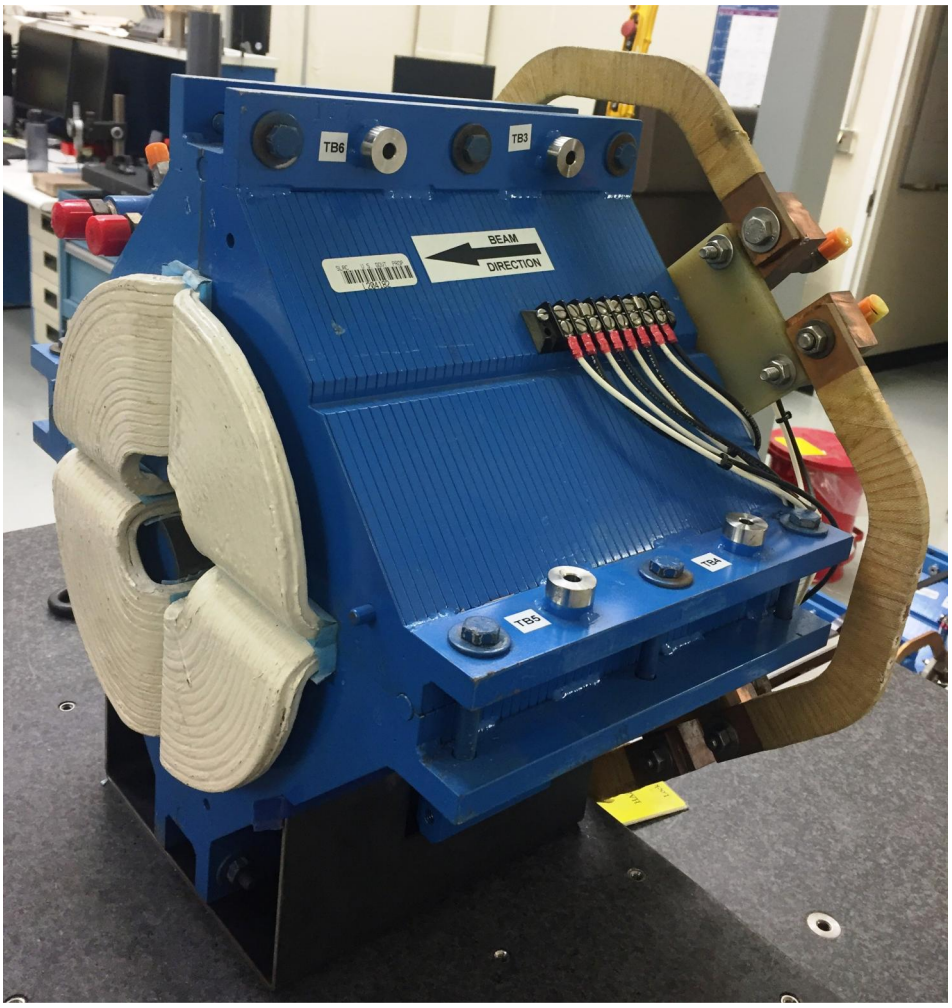
LCLS II 2Q10 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-21
Barcode # : 4196
Mfg. S/N : #20

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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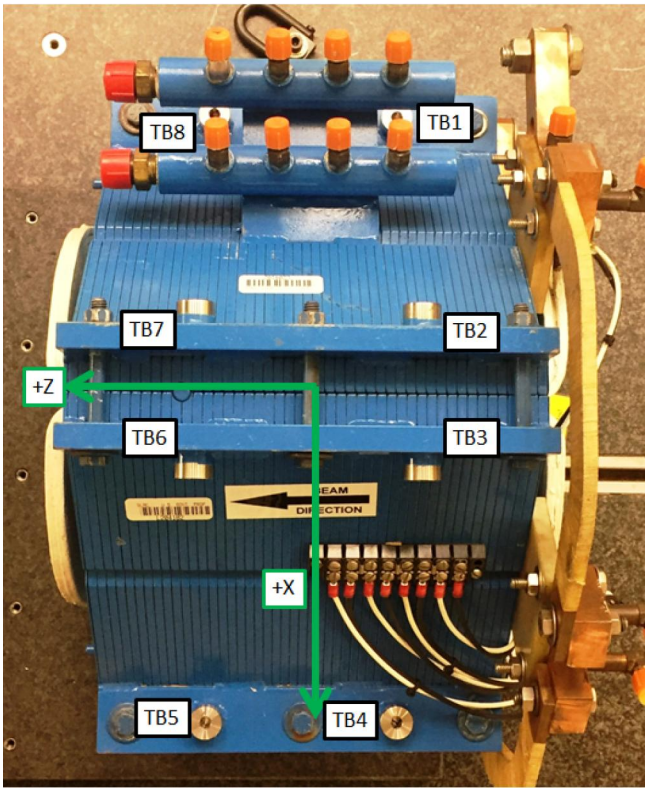
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0582	2.6789	-2.1377
TB 2	-2.6754	7.0675	-2.1621
TB 3	2.6693	7.0635	-2.1667
TB 4	7.0583	2.6797	-2.1895
TB 5	7.0544	2.6838	2.1550
TB 6	2.6812	7.0640	2.1550
TB 7	-2.6741	7.0550	2.1674
TB 8	-7.0504	2.6767	2.1945

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

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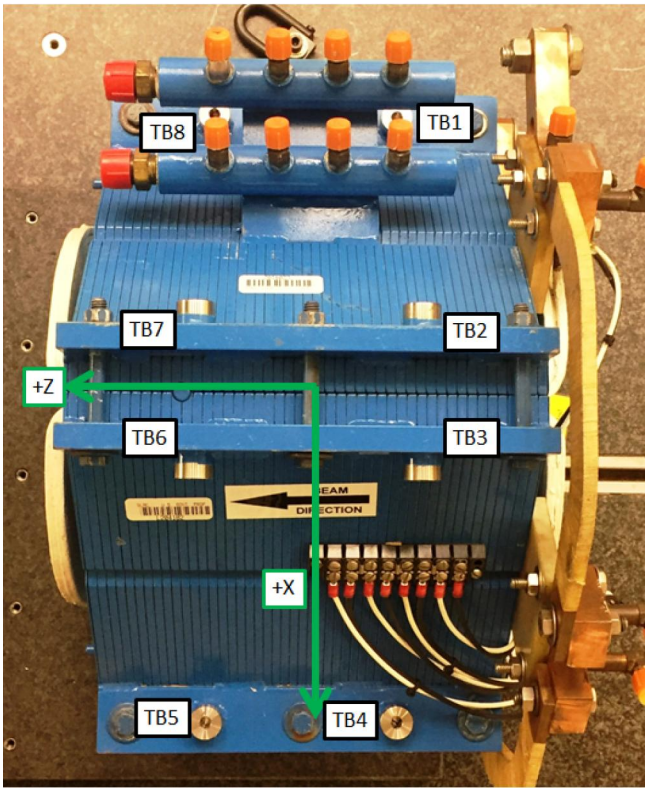
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0573	1.9913	-2.1402
TB 2	-1.9882	7.0613	-2.1612
TB 3	1.9817	7.0613	-2.1654
TB 4	7.0524	1.9924	-2.1887
TB 5	7.0511	1.9958	2.1542
TB 6	1.9934	7.0625	2.1580
TB 7	-1.9869	7.0536	2.1673
TB 8	-7.0491	1.9892	2.1945

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

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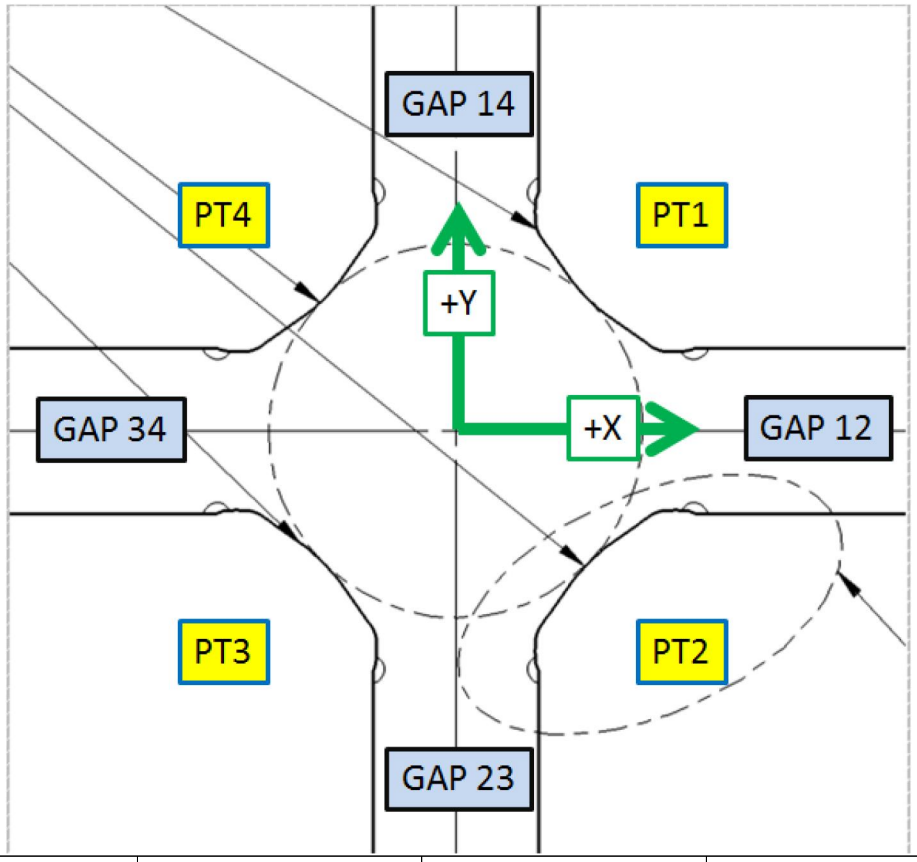
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02659	2.02925
PT Distance 2-4	2.026	2.02596	2.02822
Gap 1-2	0.8602	0.85587	0.85377
Gap 2-3	0.8602	0.85704	0.86469
Gap 3-4	0.8602	0.85938	0.85683
Gap 1-4	0.8602	0.85705	0.86017

Dimensions in Inch

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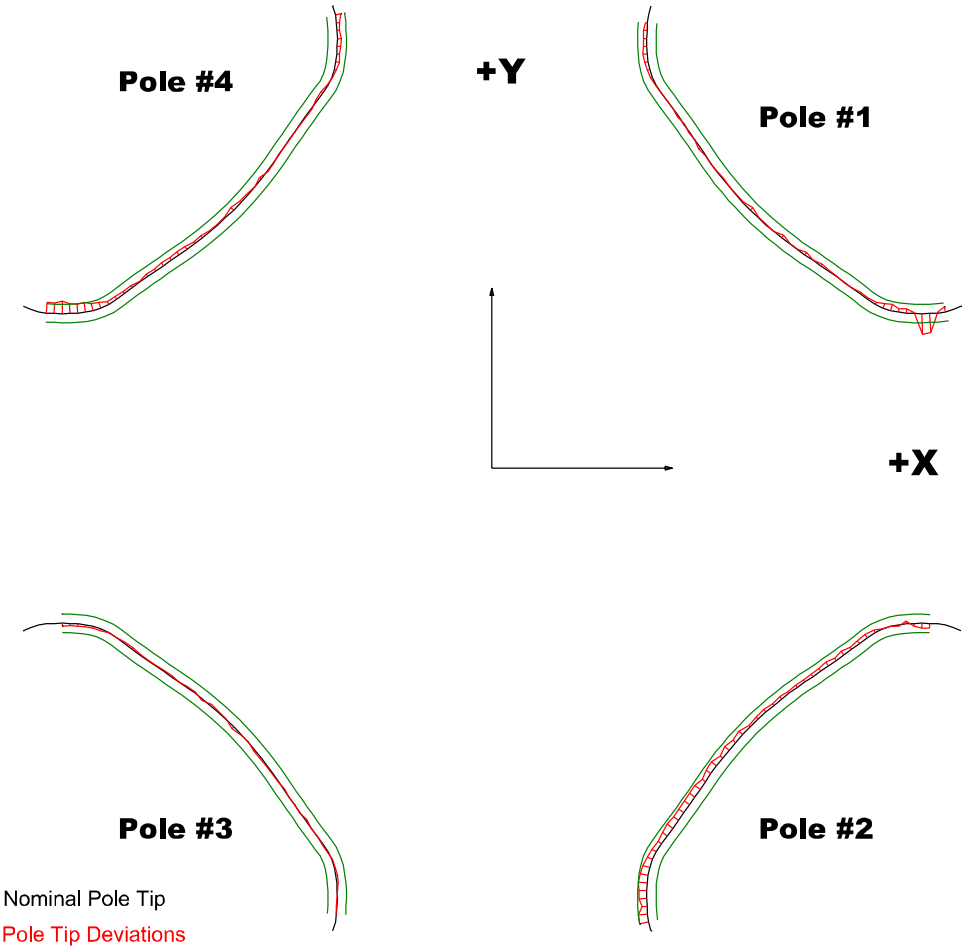
Composite Best-fit of Pole Tips, Downstream



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.	-0.0007	-0.00054	-0.0003	-0.00134
Max. Dev.	0.00225	0.00101	0.00019	0.00054

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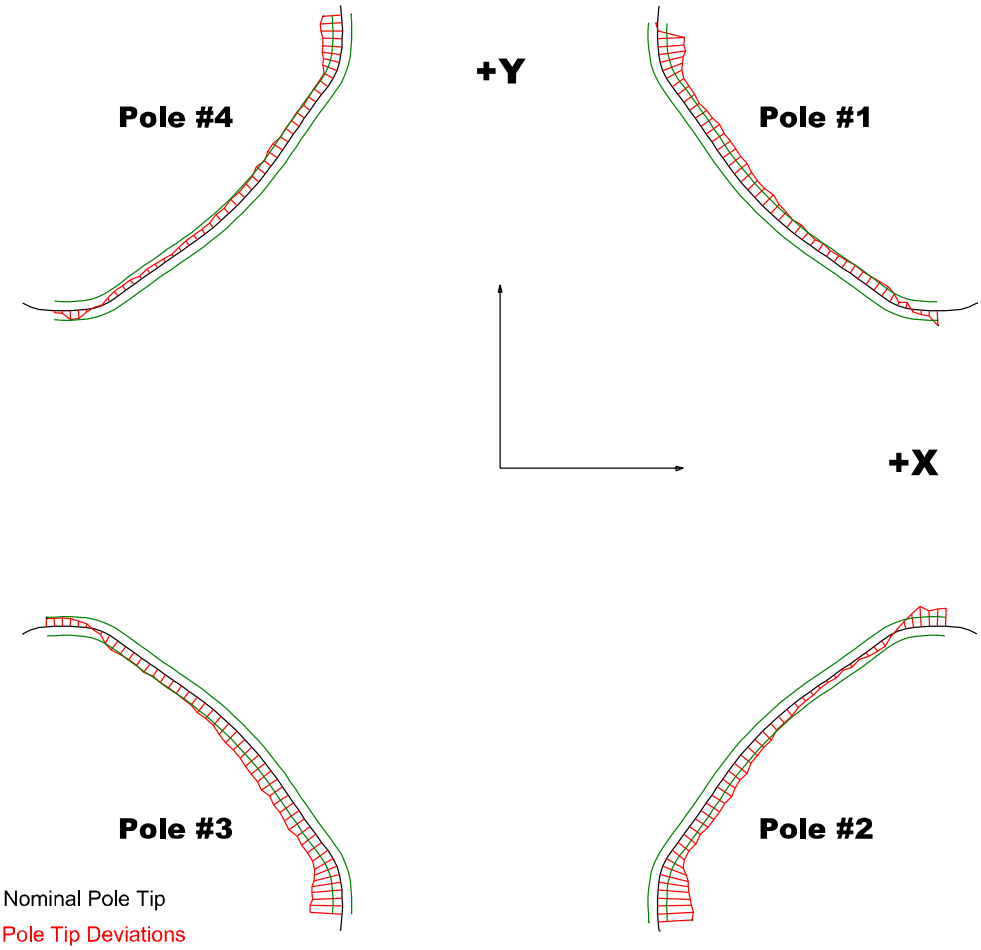
Composite Best-fit of Pole Tips, Upstream



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.	-0.0029	-0.00381	-0.00348	-0.00236
Max. Dev.	0.00157	0.00216	0.00089	0.00093

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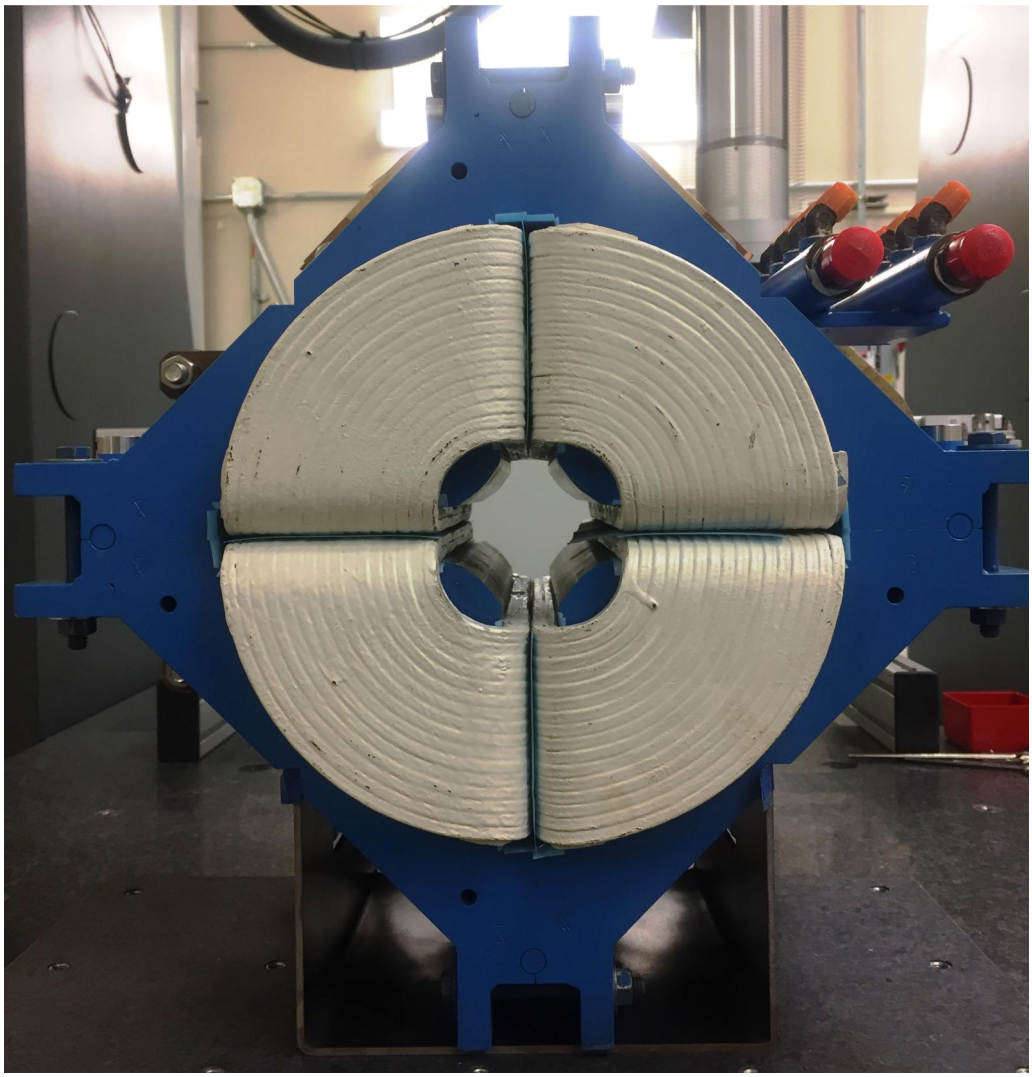
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	0.02190
Angle in Milliradians :	0.38220

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