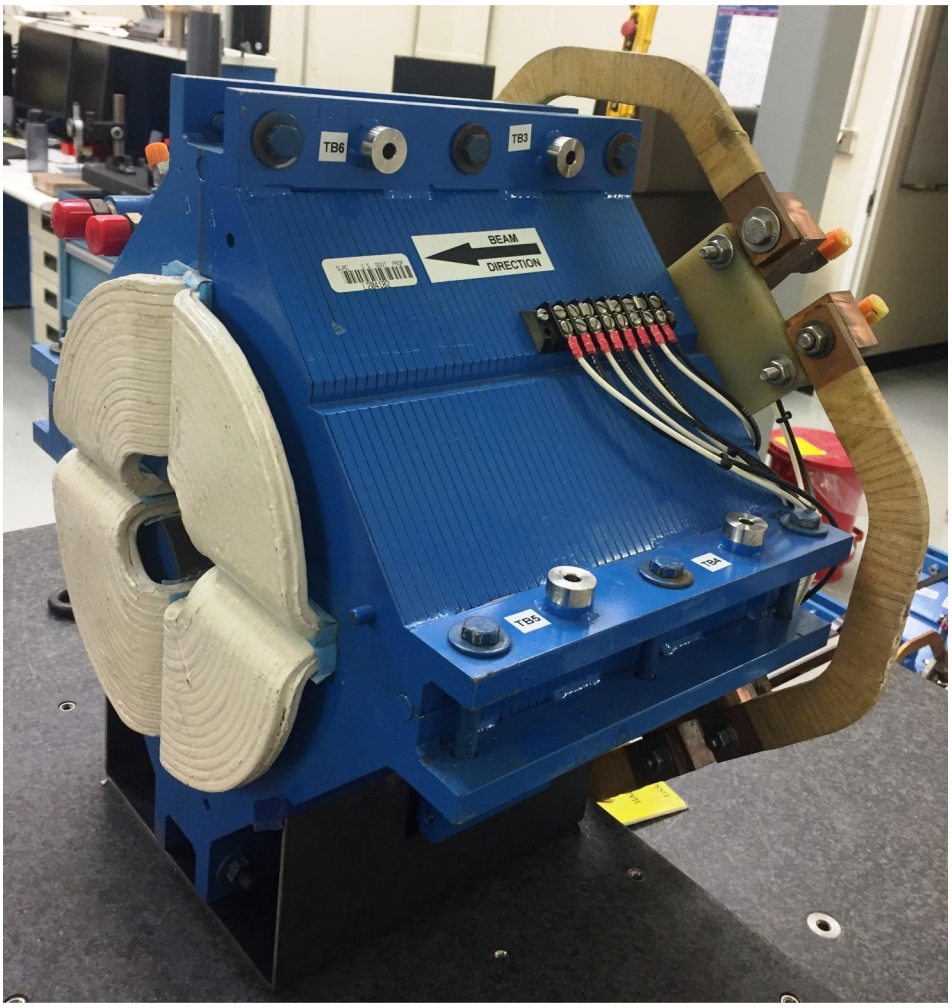
LCLS II 2Q10 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-21
Barcode # : 4203
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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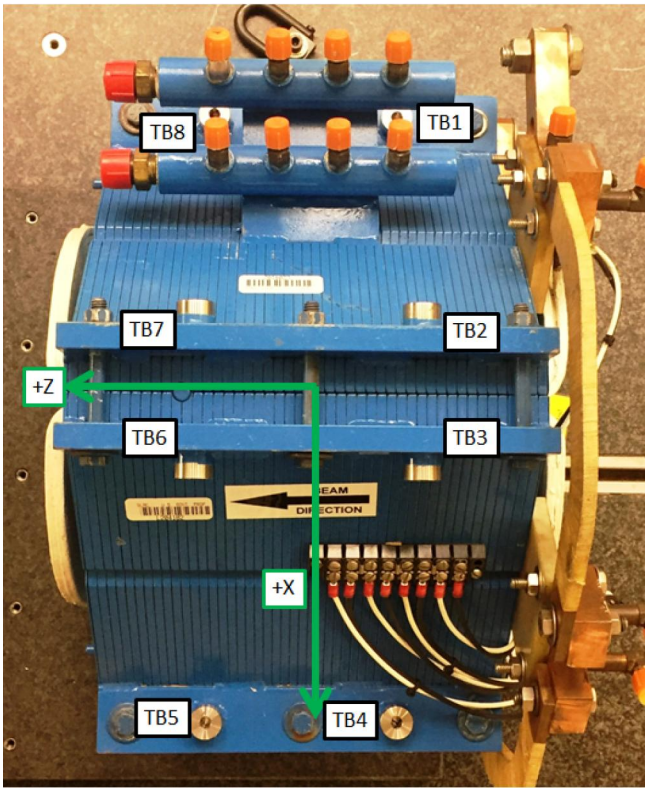
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0653	2.6753	-2.1519
TB 2	-2.6806	7.0516	-2.1665
TB 3	2.6644	7.0563	-2.1716
TB 4	7.0377	2.6739	-2.1890
TB 5	7.0456	2.6809	2.1490
TB 6	2.6782	7.0549	2.1638
TB 7	-2.6745	7.0449	2.1661
TB 8	-7.0433	2.6788	2.1836

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

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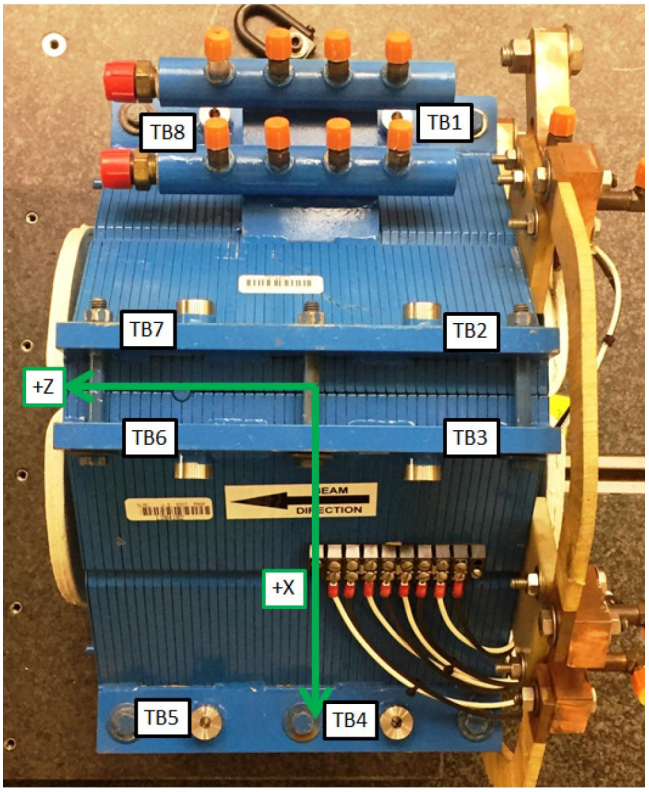
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0643	1.9884	-2.1509
TB 2	-1.9935	7.0481	-2.1683
TB 3	1.9775	7.0544	-2.1702
TB 4	7.0372	1.9859	-2.1880
TB 5	7.0488	1.9925	2.1507
TB 6	1.9895	7.0550	2.1653
TB 7	-1.9865	7.0461	2.1656
TB 8	-7.0450	1.9918	2.1843

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

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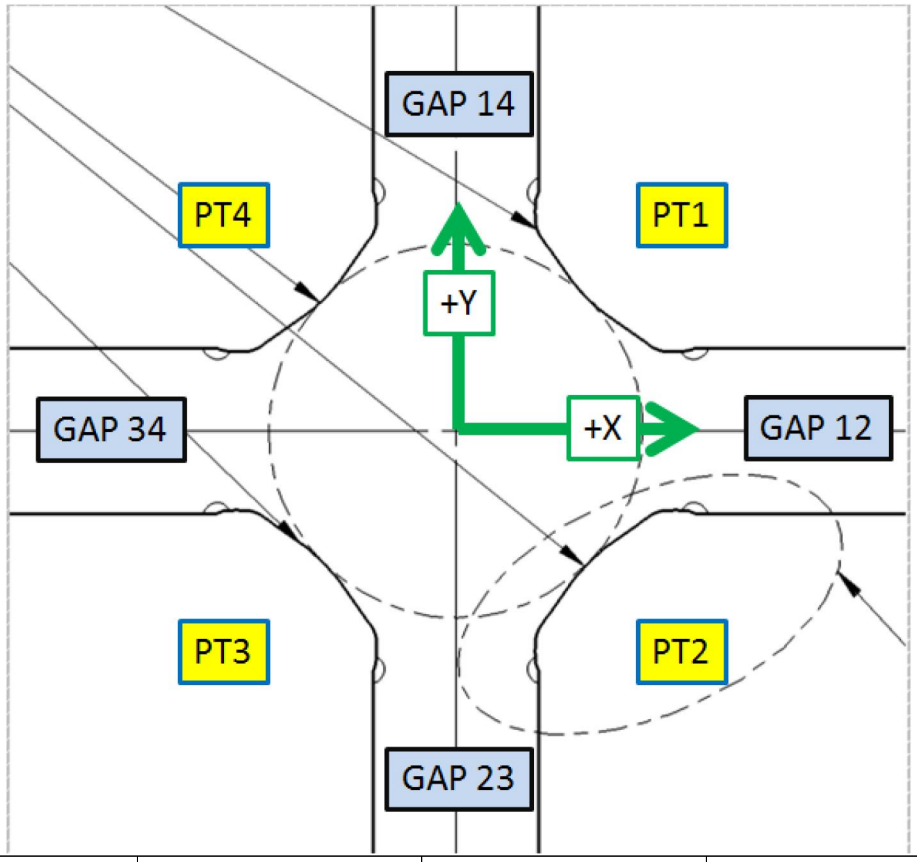
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02569	2.02596
PT Distance 2-4	2.026	2.0252	2.02546
Gap 1-2	0.8602	0.85675	0.85622
Gap 2-3	0.8602	0.85806	0.85854
Gap 3-4	0.8602	0.85818	0.85921
Gap 1-4	0.8602	0.85807	0.86102

Dimensions in Inch

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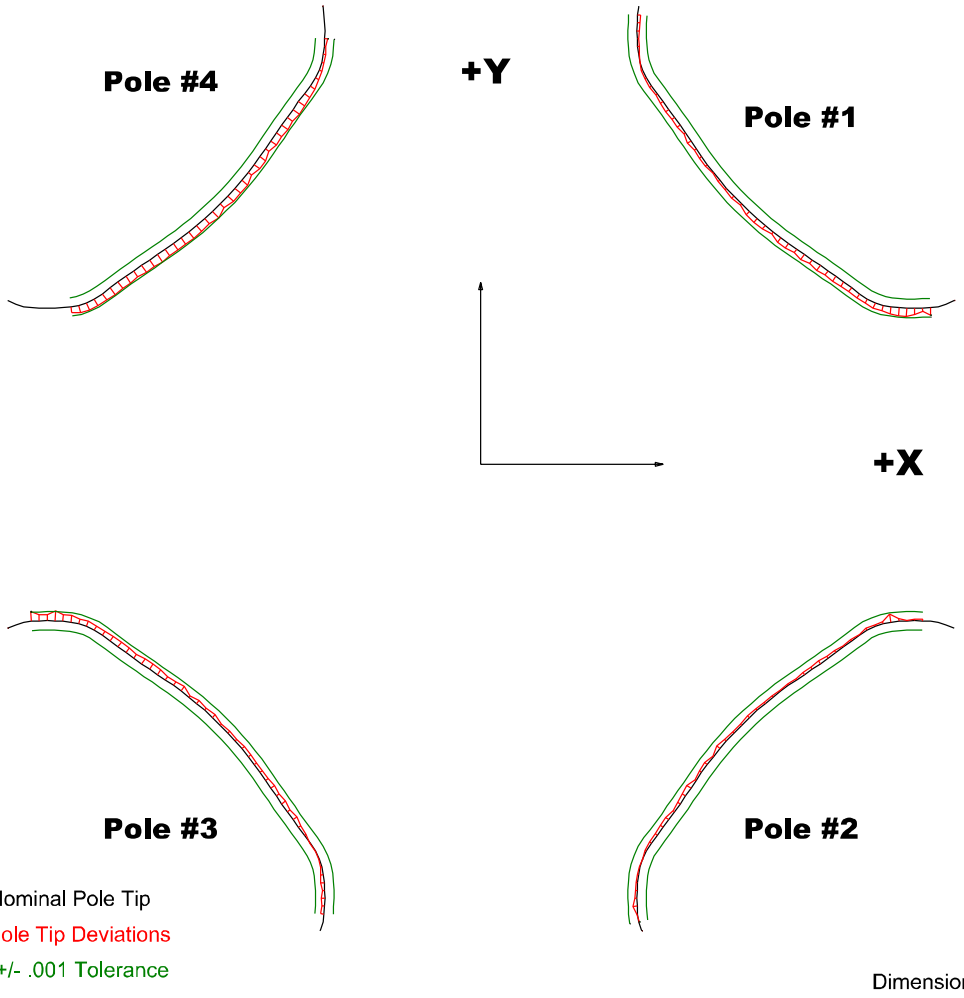
Composite Best-fit of Pole Tips, Downstream



Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00031	-0.00007	-0.00038	0.00018
Max. Dev.	0.00089	0.00085	0.00105	0.00102

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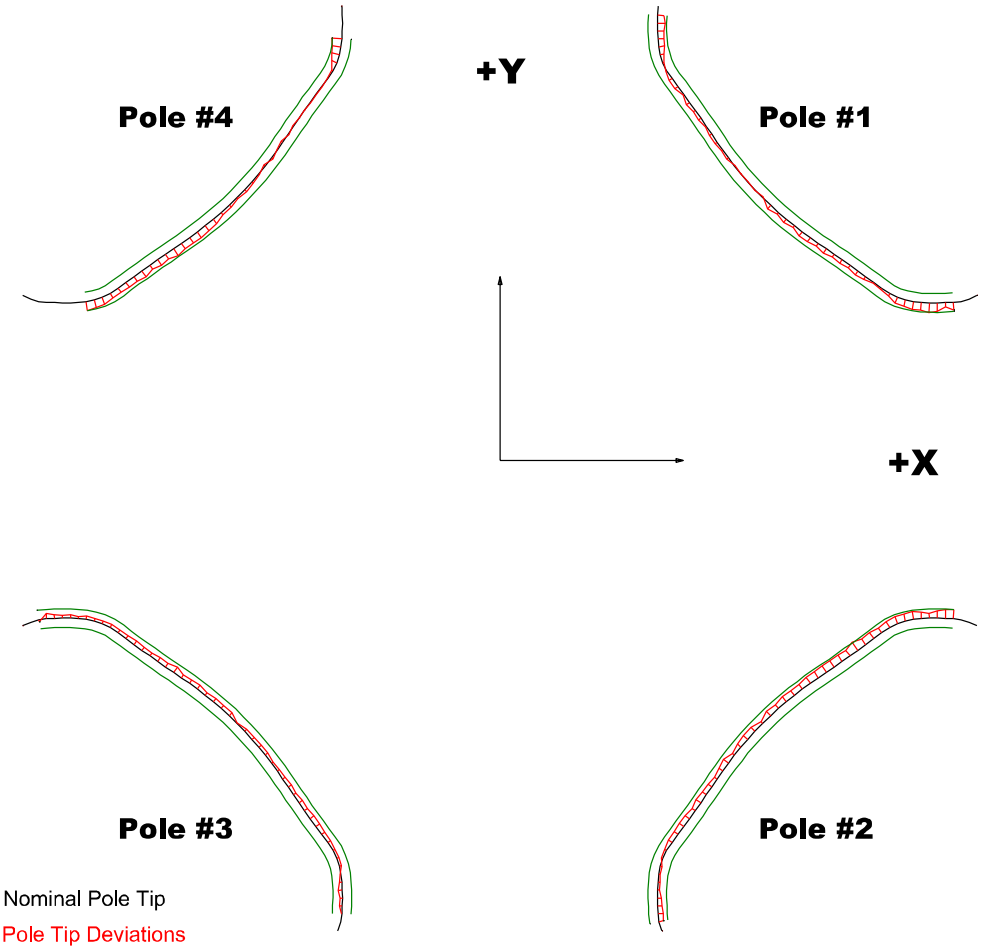
Composite Best-fit of Pole Tips, Upstream



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.	-0.00085	-0.00055	-0.00044	-0.0011
Max. Dev.	0.00107	0.00109	0.00071	0.00098

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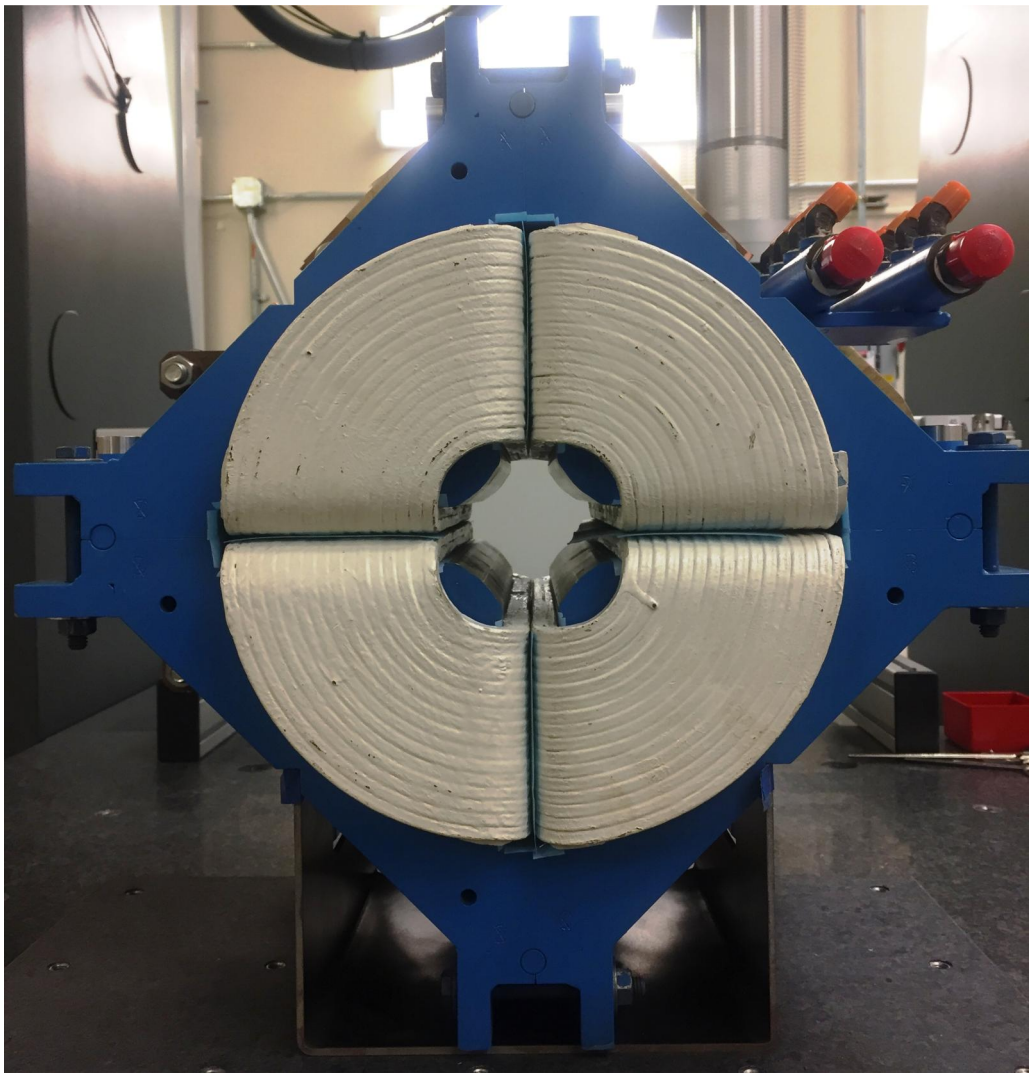
Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	0.00485
Angle in Milliradians :	0.08473

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