

LCLS II 2Q10 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-30
Barcode # : 4211
Mfg. S/N : MFG SN 09

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.

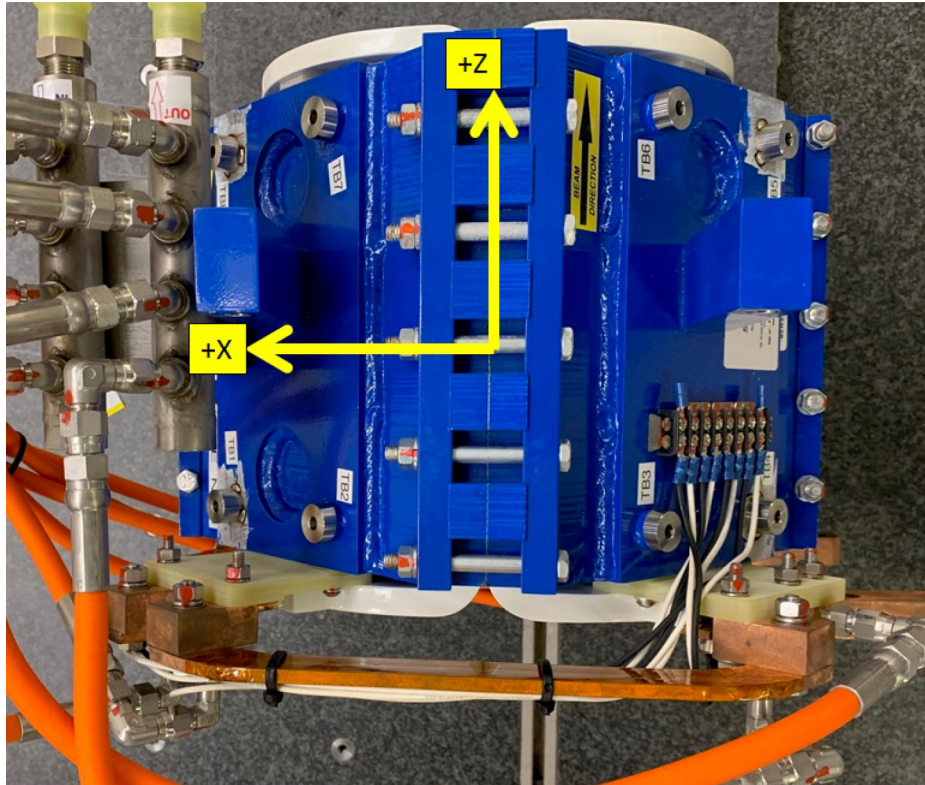
Coordinate Origins

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



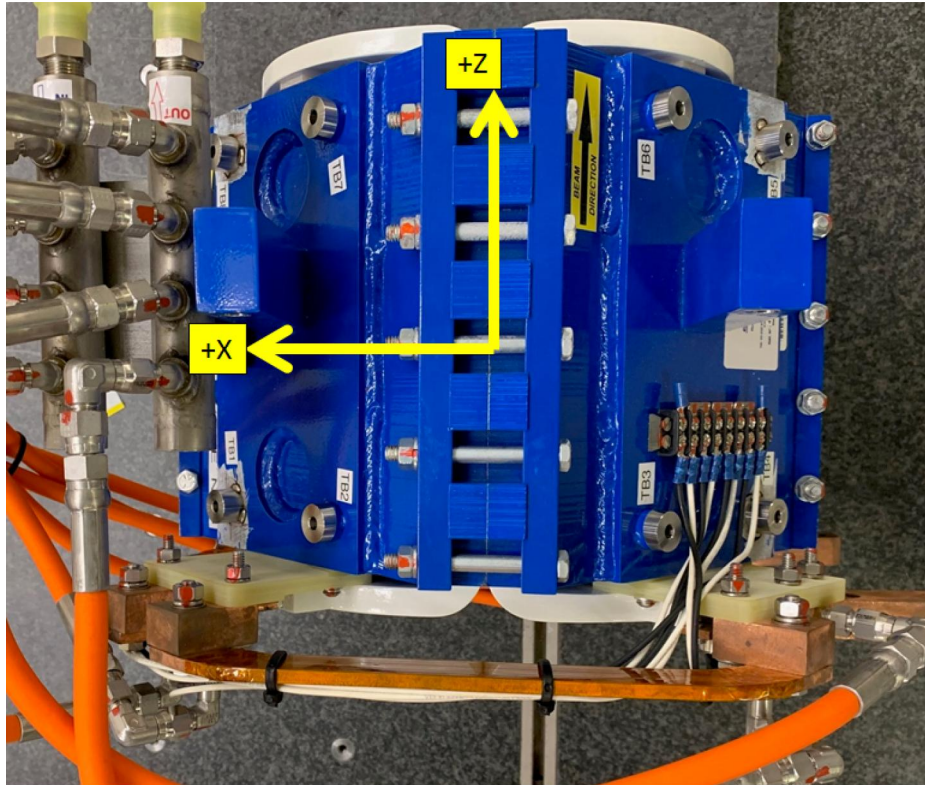
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.5361	3.9648	-3.6763
TB 2	3.9622	6.4796	-3.7342
TB 3	-3.9819	6.4680	-3.7407
TB 4	-6.4996	3.9815	-3.6782
TB 5	-6.4752	3.9886	3.7088
TB 6	-3.9821	6.4638	3.7398
TB 7	3.9697	6.4762	3.7469
TB 8	6.5024	3.9860	3.6999

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

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Tooling Ball Locations



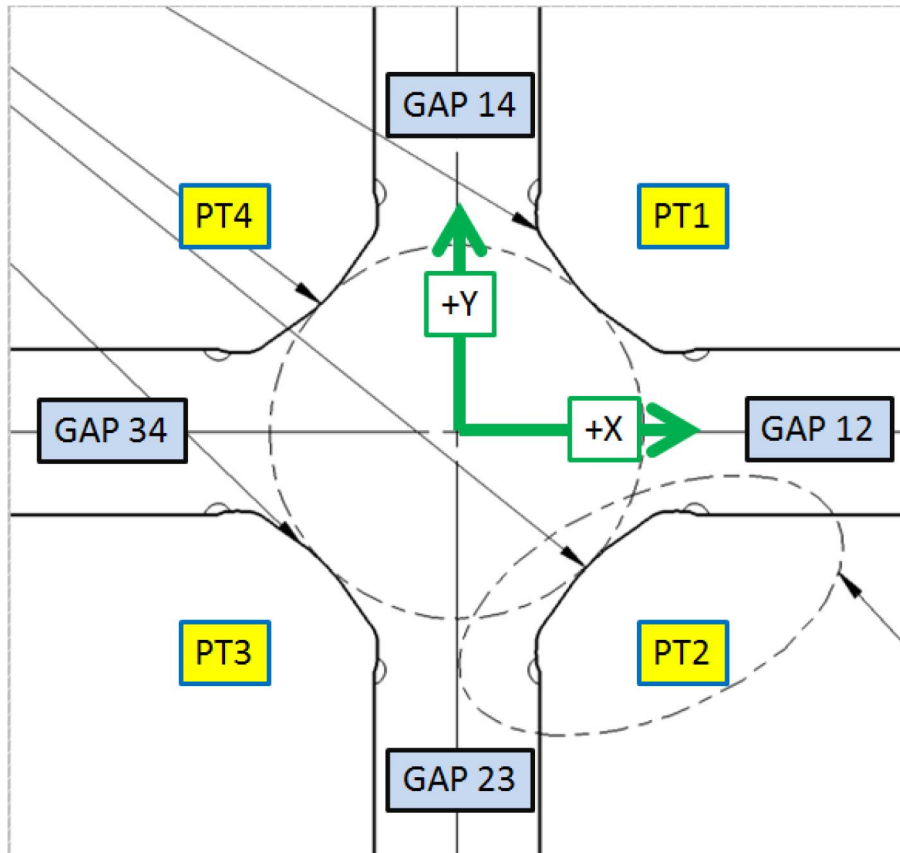
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.0513	3.4776	-3.6870
TB 2	3.4765	5.9932	-3.7348
TB 3	-3.4948	5.9825	-3.7397
TB 4	-6.0110	3.4981	-3.6871
TB 5	-5.9890	3.5024	3.7140
TB 6	-3.4957	5.9782	3.7399
TB 7	3.4833	5.9900	3.7462
TB 8	6.0206	3.4959	3.7047

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

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Pole Tip Gap Measurements



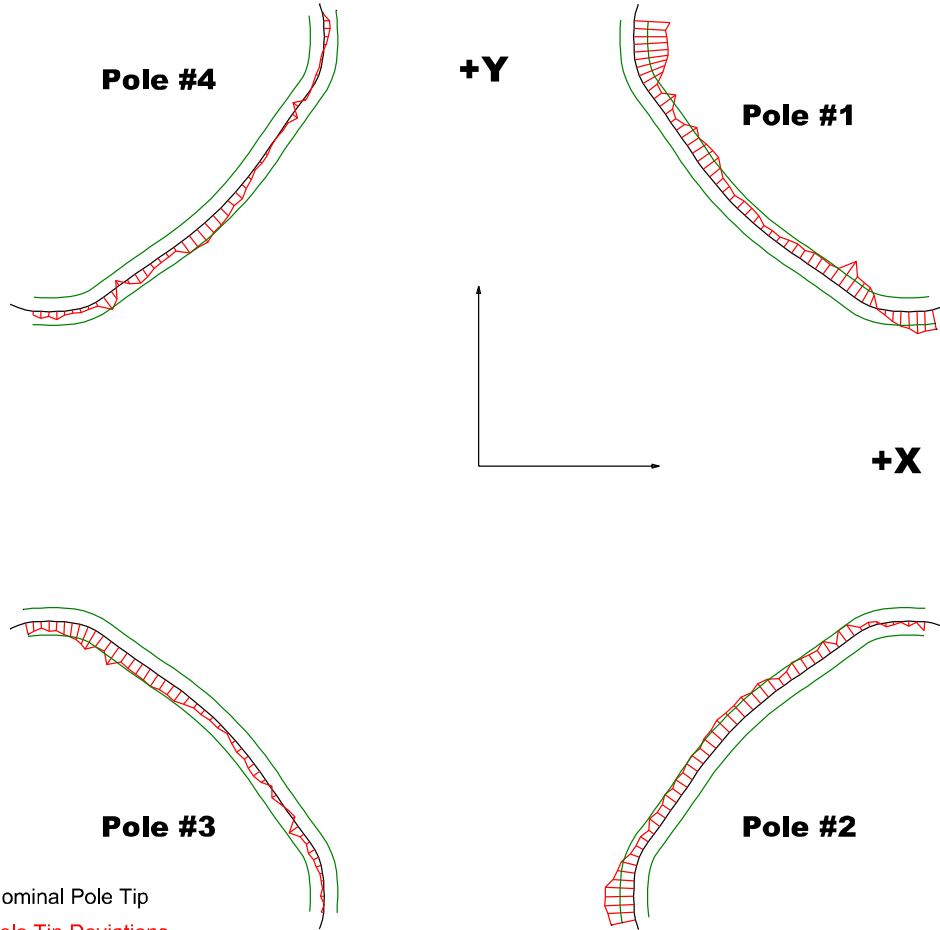
	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02702	2.02678
PT Distance 2-4	2.026	2.02403	2.02562
Gap 1-2	0.8602	0.85791	0.85689
Gap 2-3	0.8602	0.85638	0.85742
Gap 3-4	0.8602	0.85799	0.85986
Gap 1-4	0.8602	0.86032	0.85929

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

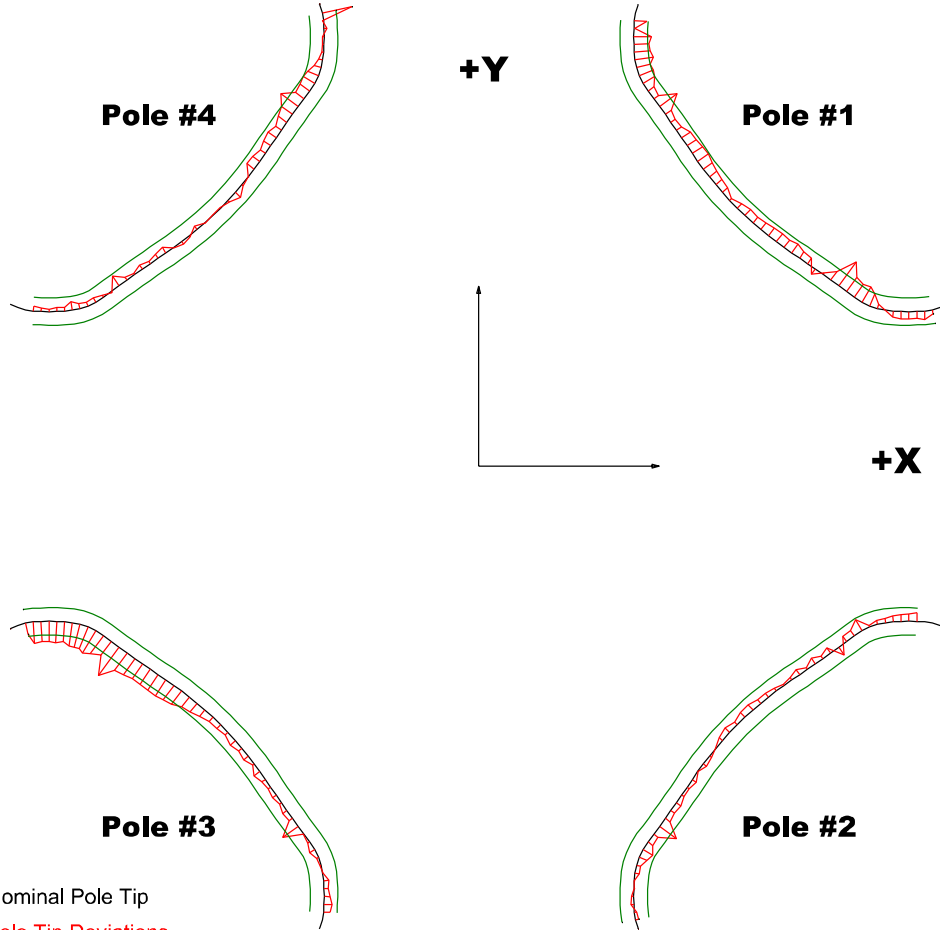
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00258	-0.00062	-0.00157	-0.00049
Max. Dev.	0.00161	0.00213	0.00024	0.00122

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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

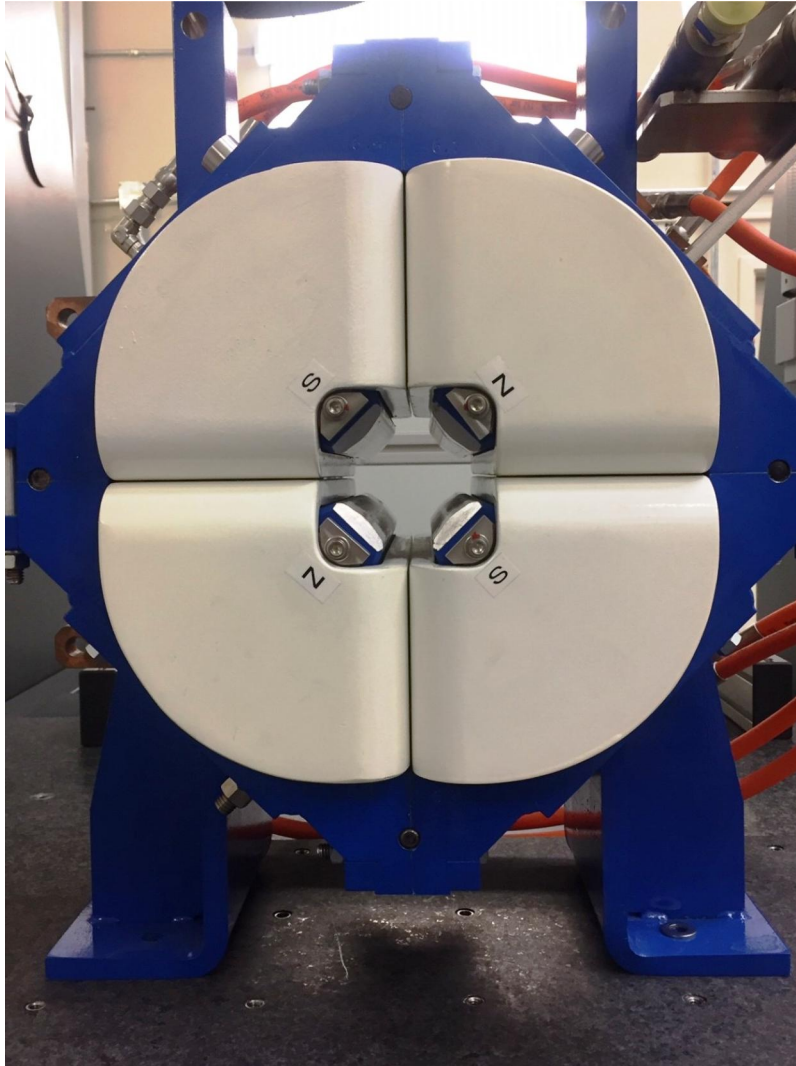
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00213	-0.0015	-0.00256	-0.00158
Max. Dev.	0.00062	0.00092	0.0006	0.0022

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Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° : -0.08288

Angle in Milliradians : -1.44661

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