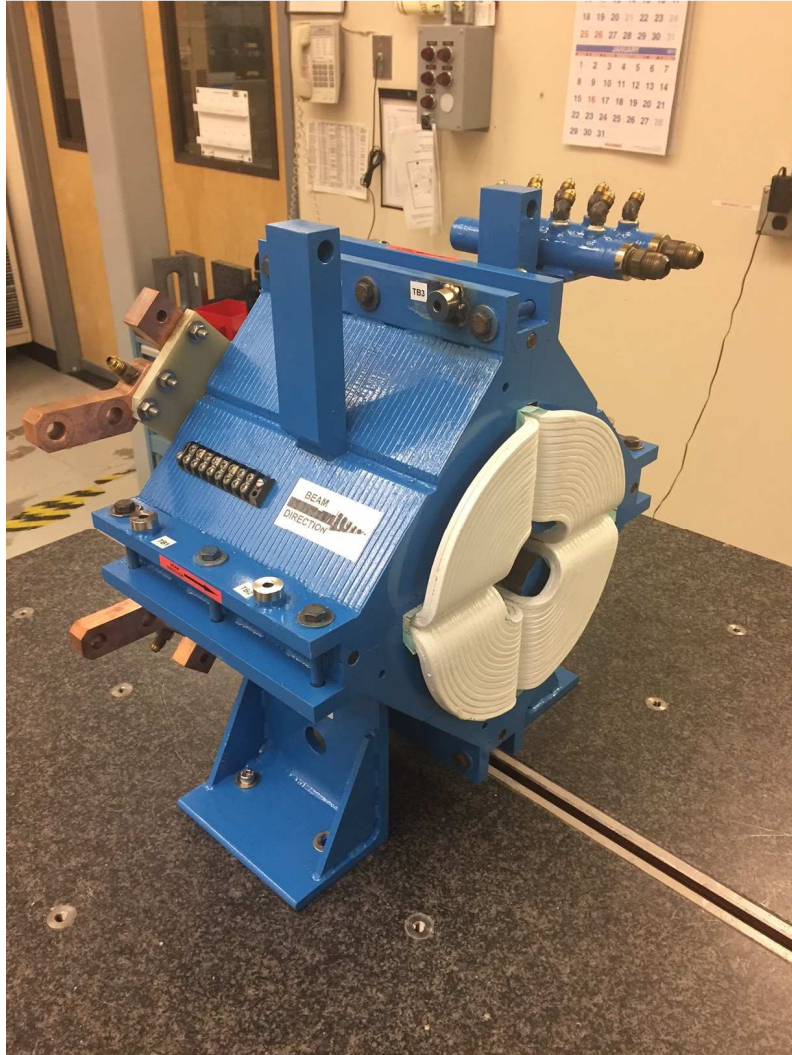


LCLS II 50Q1 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann/K. Grouev
Drawing No. : SA-344-113-50
Barcode # : 4105
Mfg. S/N : 50Q1

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 .100 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.

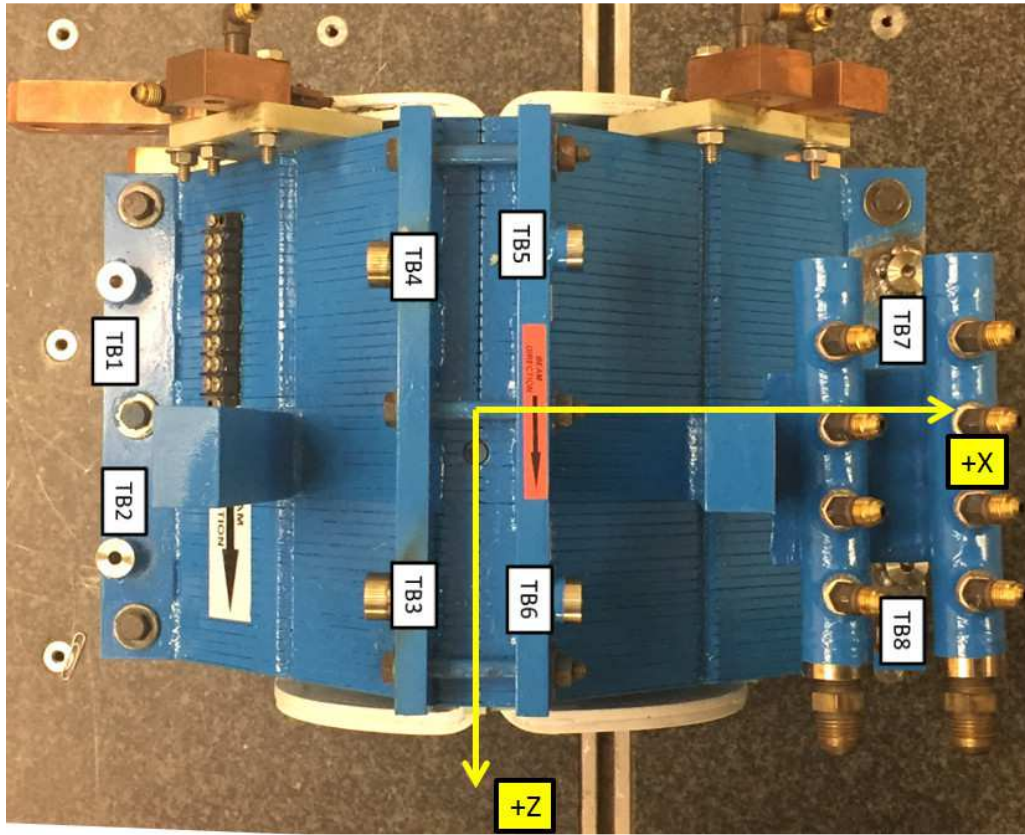
Coordinate Origins

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



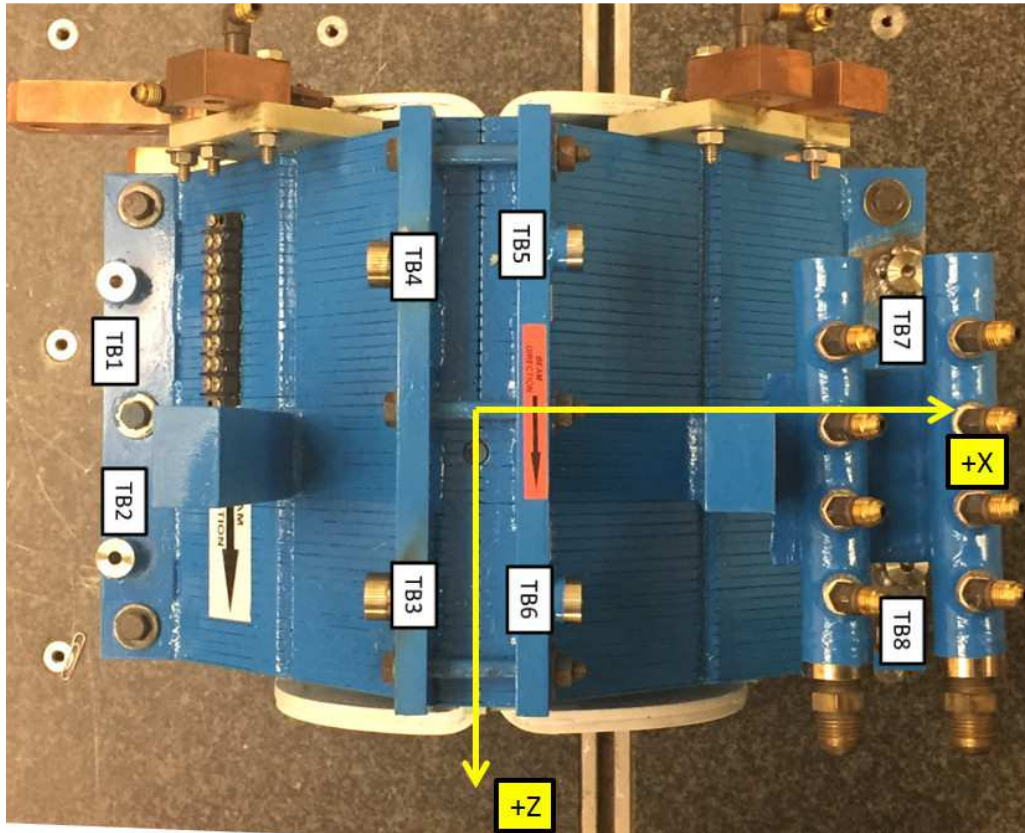
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.4062	2.6747	-2.5298
TB 2	-7.3679	2.6803	2.7042
TB 3	-2.6855	7.3523	2.8962
TB 4	-2.6743	7.3618	-2.2735
TB 5	2.6697	7.3887	-2.5178
TB 6	2.6680	7.3615	2.9373
TB 7	7.3905	2.6837	2.6939
TB 8	7.4174	2.6721	-2.6805

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

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Tooling Ball Locations



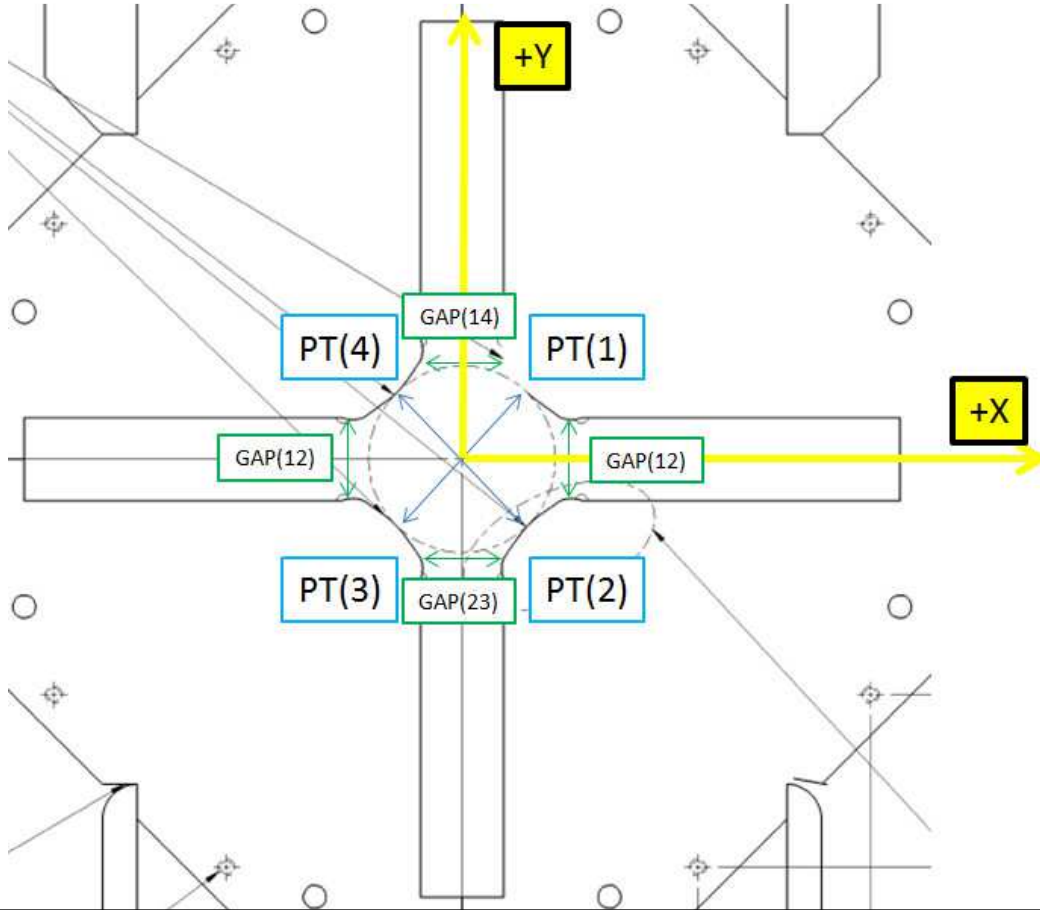
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.4105	1.9874	-2.5299
TB 2	-7.3740	1.9927	2.7030
TB 3	-1.9981	7.3440	2.9044
TB 4	-1.9872	7.3571	-2.2693
TB 5	1.9789	7.3882	-2.5186
TB 6	1.9801	7.3655	2.9353
TB 7	7.3902	1.9963	2.6963
TB 8	7.4154	1.9847	-2.6786

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

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Pole Tip Gap Measurements



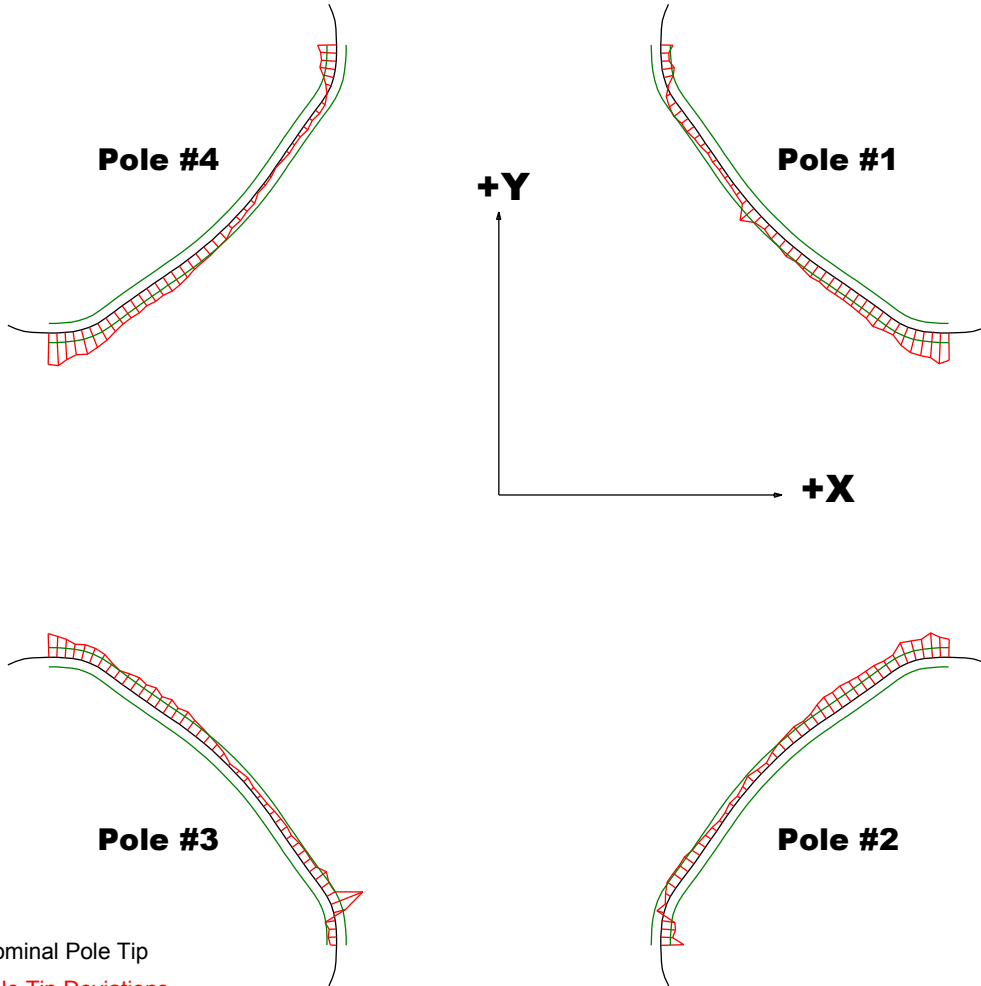
	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	2.026 ± .002	2.02503	2.02518
Pole Tip Distance 2-4	2.026 ± .002	2.025	2.02521
Gap 1-2	0.860	0.85308	0.8541
Gap 2-3	0.860	0.85996	0.85914
Gap 3-4	0.860	0.85203	0.85549
Gap 4-1	0.860	0.86042	0.85959

Dimensions in Inch

Barcode # : 4105

Mfg. S/N : 50Q1

Composite Best-fit of Pole Tips, Downstream



Black = Nominal Pole Tip
 Red = Pole Tip Deviations
 Green = +/- .001 Tolerance

Dimensions in Inch

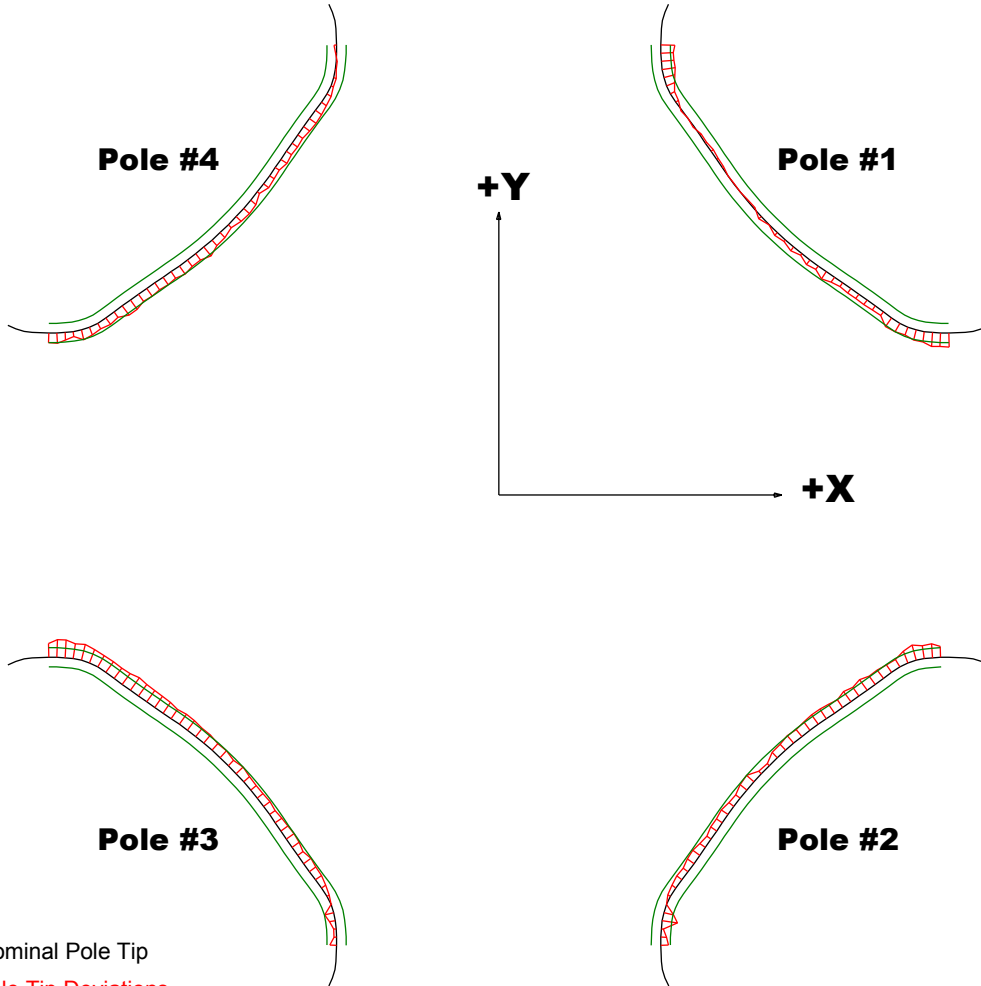
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00129	-0.00242	-0.00106	-0.00198
Max. Dev.	0.00322	0.00258	0.00358	0.0034

Barcode # : 4105

Mfg. S/N : 50Q1

Composite Best-fit of Pole Tips, Upstream



Black = Nominal Pole Tip
 Red = Pole Tip Deviations
 Green = +/- .001 Tolerance

Dimensions in Inch

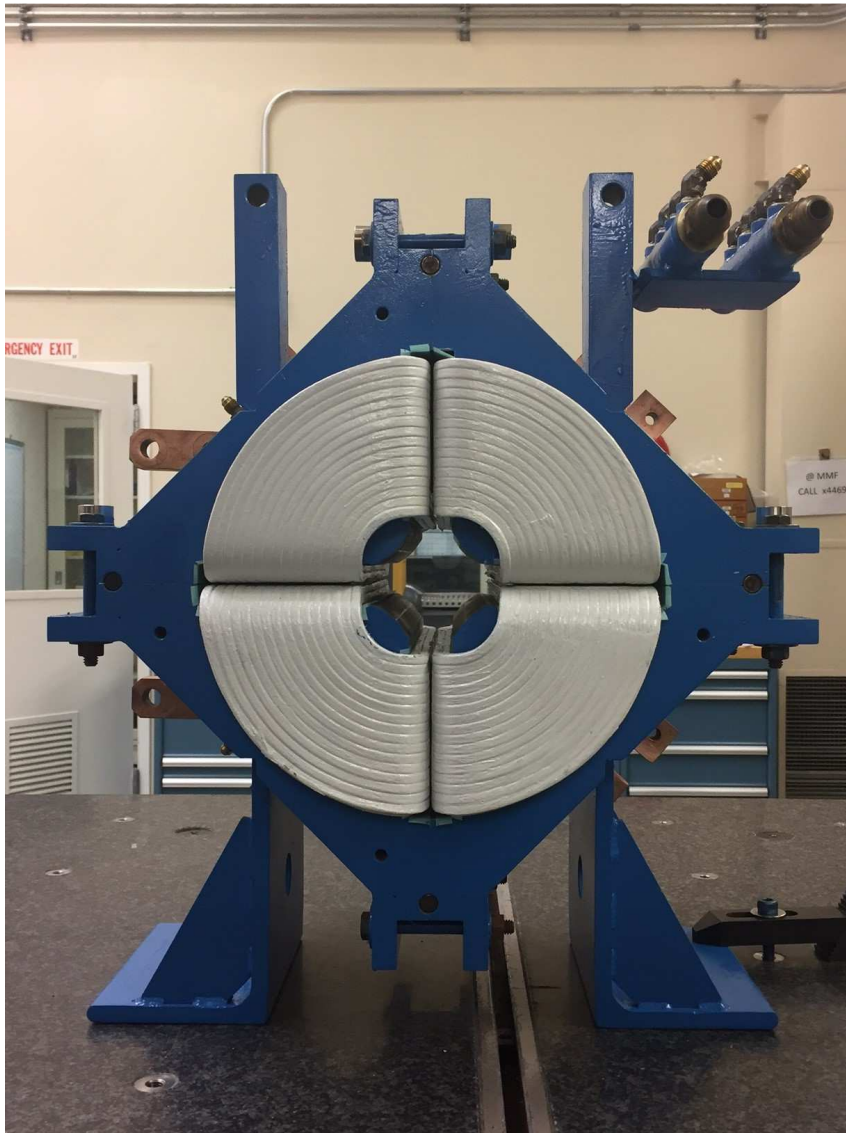
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00148	-0.00161	-0.00096	-0.00029
Max. Dev.	0.00147	0.00163	0.00186	0.00122

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Angle of the Composite Pole Tip Best-Fit In Relation to Base



Angle in Decimal Degrees ° :0.01264

Angle in Milliradians :0.22066

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