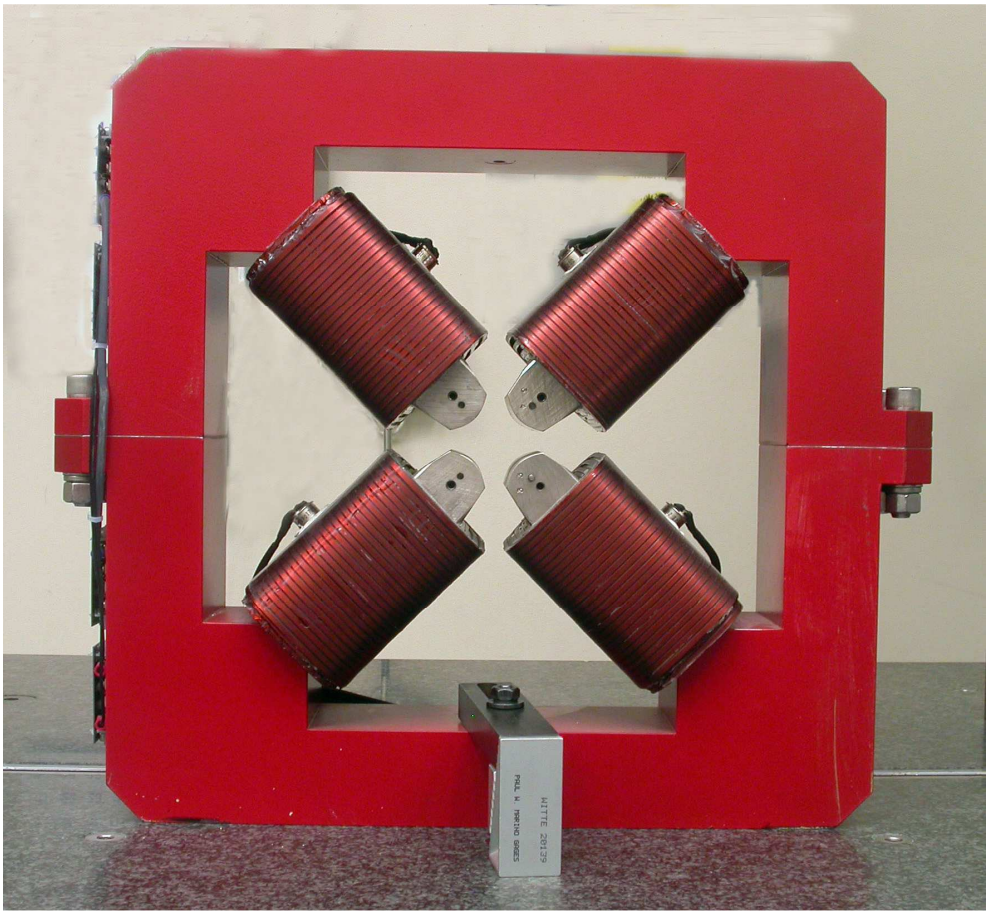
SLAC NATIONAL ACCELERATOR LABORATORY

LCLS-II

LCLS II Magnet Fiducialization Report
Injector Quadrupole 1.26Q3.5



Inspector : K. Caban

Engineer : J. Amann

Drawing No. : SA-380-309-12 R1

Barcode No.: 4008

Mfg. S/N : 006

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 .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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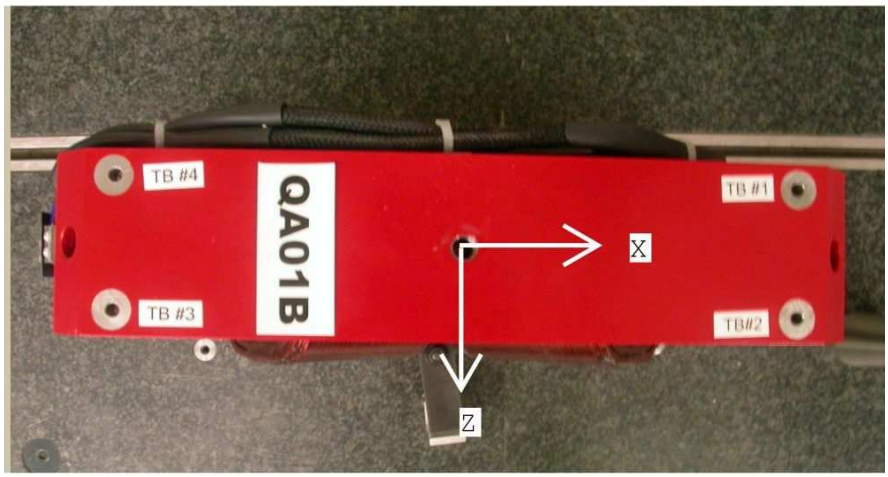
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.49743	8.87607	-1.25291
TB 2	6.49747	8.87591	1.24632
TB 3	-6.49953	8.87321	1.24545
TB 4	-6.50130	8.87282	-1.25393
TB A	6.49795	8.18771	-1.25333
TB B	6.49799	8.18811	1.24710
TB C	-6.50057	8.18571	1.24605
TB D	-6.50119	8.18526	-1.25368

Tooling Ball Locations (1-4) are 1 inch above unpainted surface pads
Tooling Ball Locations (A-D) are 5/16 inch above unpainted surface pads

Dimensions in Inch

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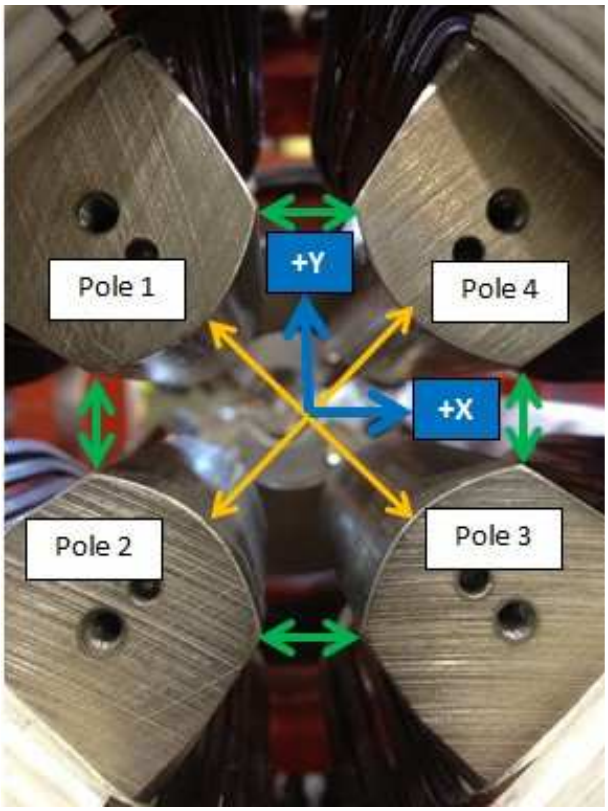
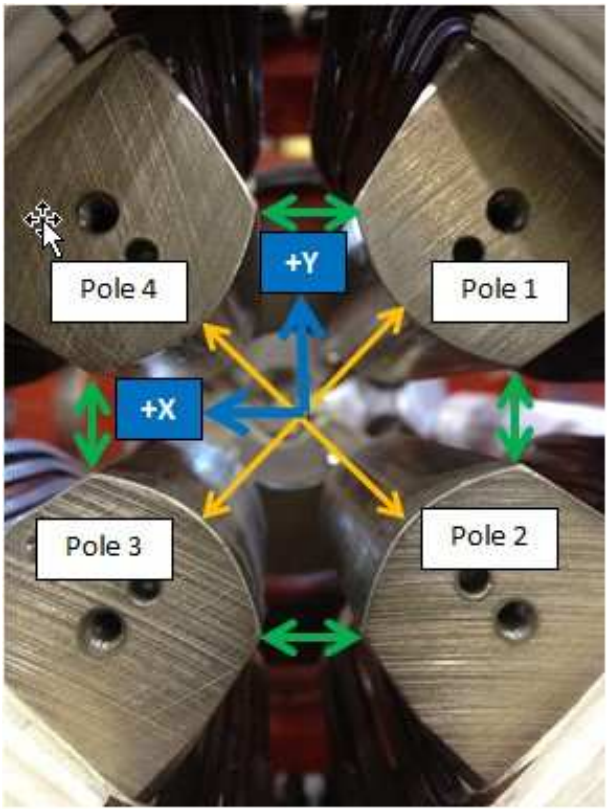
Pole Tip Gap Measurements

Pole Tips View from Downstream



Pole Tips View from Upstream



	Nominal Distance	Downstream Pole Ends	Upstream Pole Ends
Pole Tip Distance 1-3	1.260	1.26156	1.26022
Pole Tip Distance 2-4	1.260	1.26099	1.26046
Gap 1-2	.422	0.42564	0.42198
Gap 2-3	.422	0.42105	0.42186
Gap 3-4	.422	0.42437	0.42295
Gap 4-1	.422	0.42042	0.42198

Dimensions in Inch

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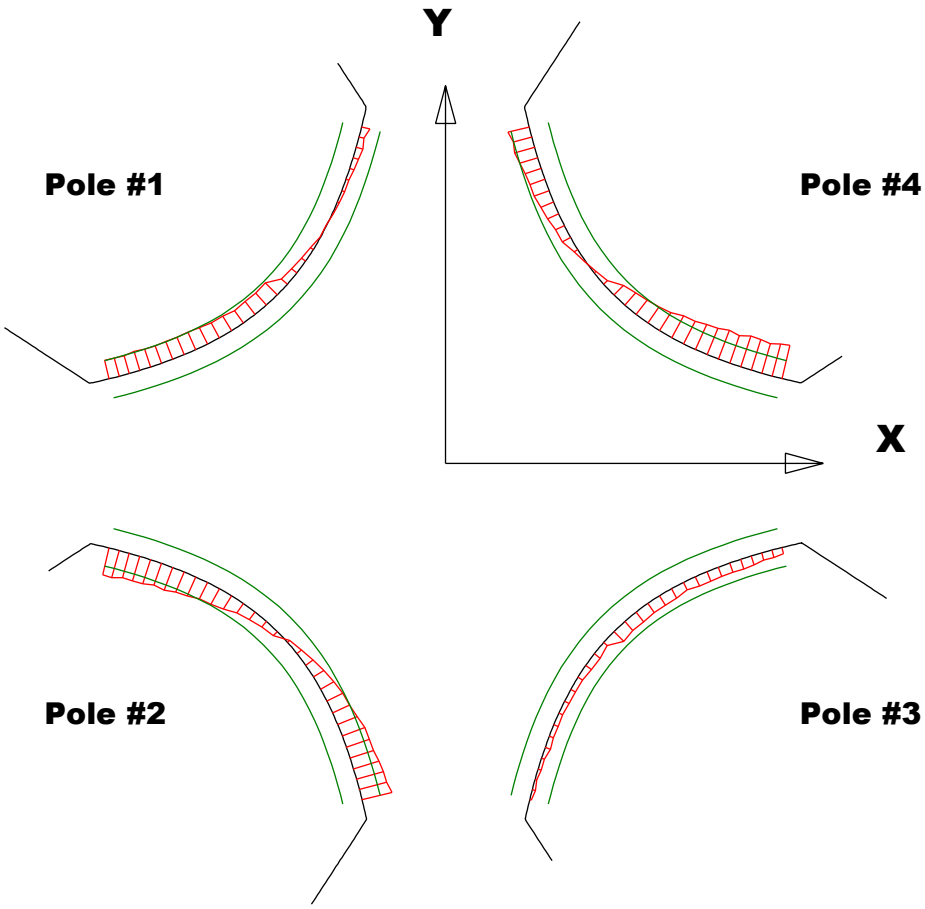
Composite Best-fit of Pole Tips, Downstream



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.	-0.00106	-0.0015	-0.00073	-0.00182
Max. Dev.	0.00045	0.00165	-0.00008	0.00116

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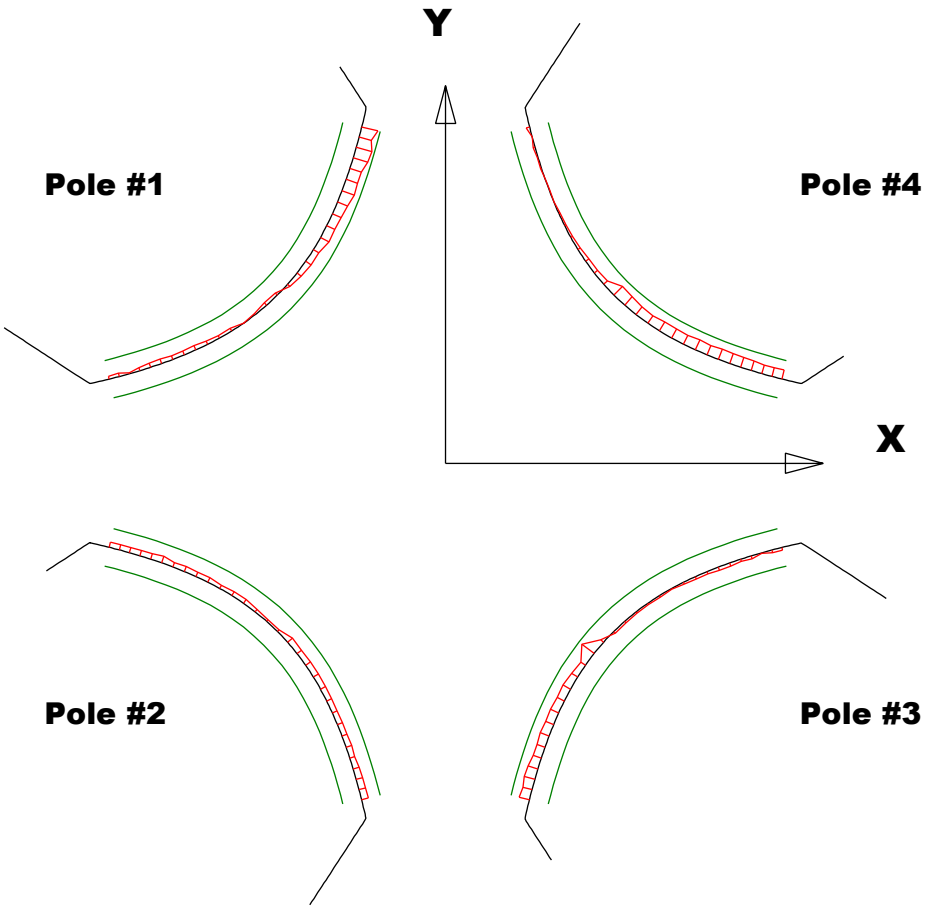
Composite Best-fit of Pole Tips, Upstream



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.	-0.00026	0.00012	-0.00019	-0.00064
Max. Dev.	0.00088	0.00038	0.00081	0.00019

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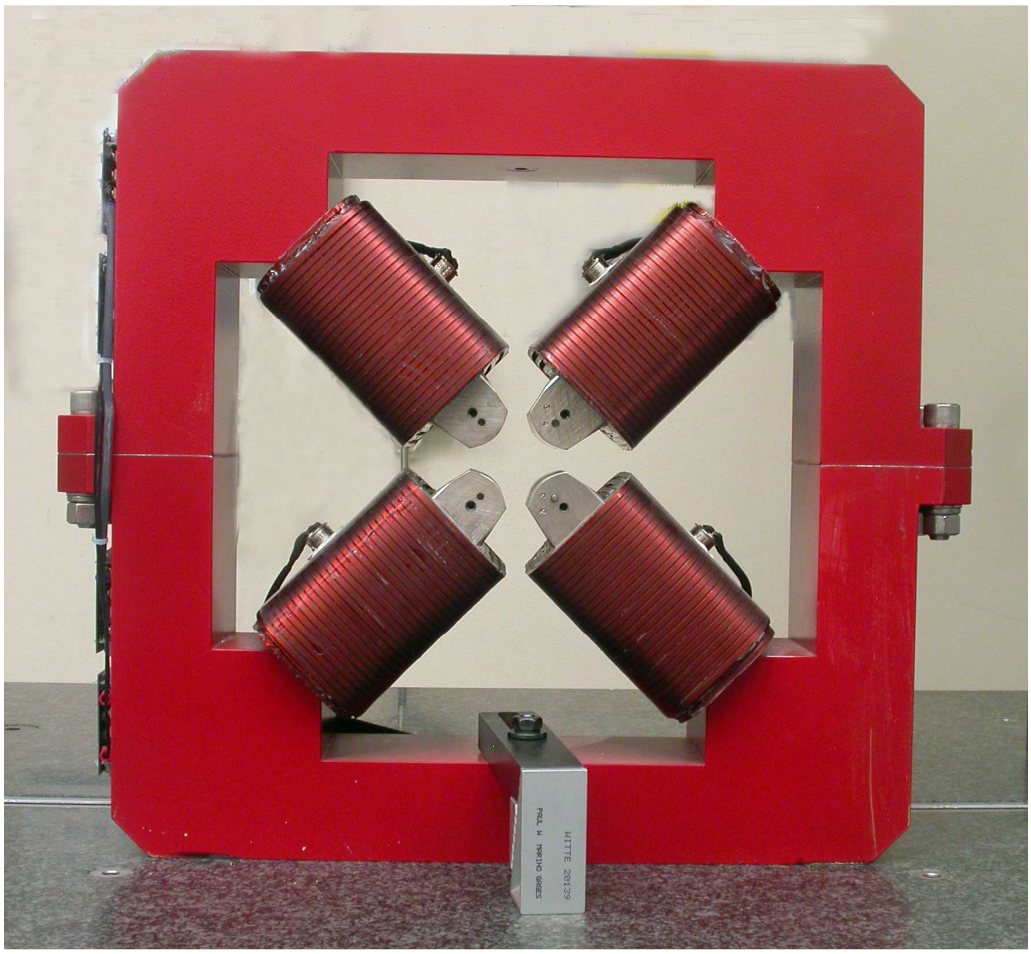
Angle of the Composite Pole Tip Best-Fit In Relation to Tooling Ball Plane



Angle in Decimal Degrees ° = -0.00973

Angle in Milliradians = -0.16989

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