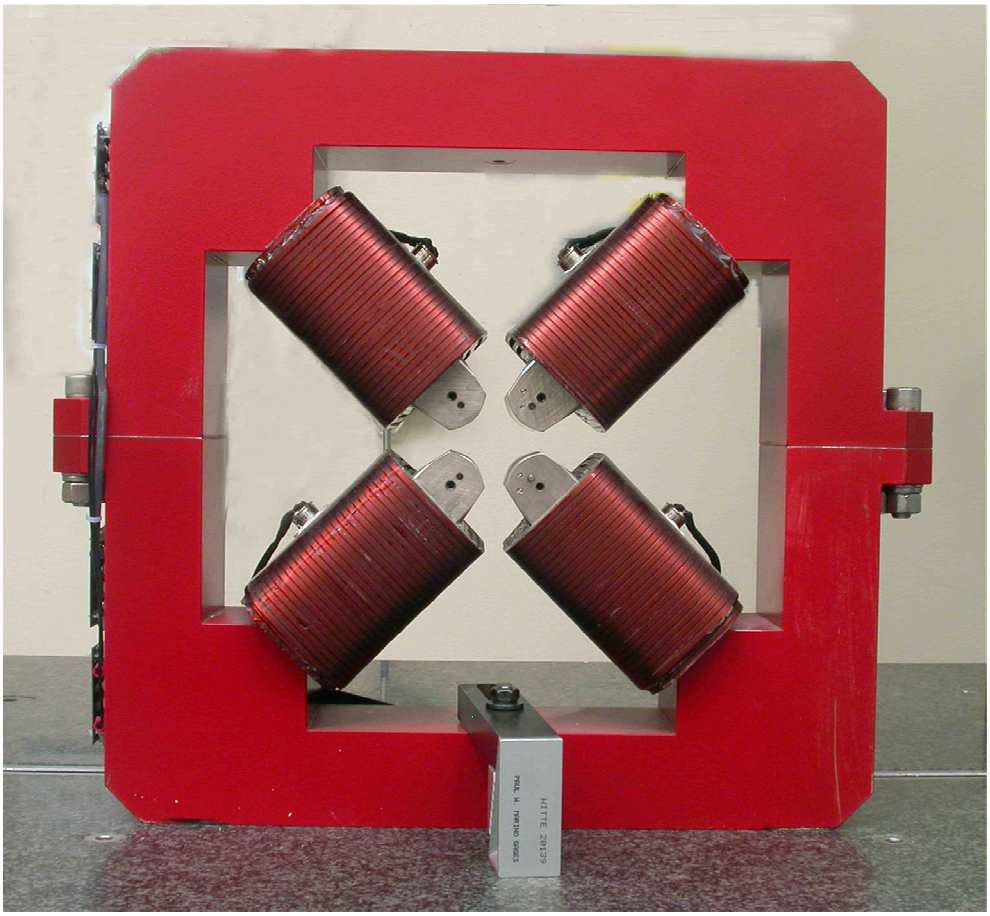
SLAC
NATIONAL ACCELERATOR LABORATORY

LCLS-II

LCLS II Injector Quadrupole Fiducialization Report



Barcode # : 002738

Beamline Name: QE02B

Coordinate System Setup

Spatial Alignment

The Spatiai 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 alinment 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 axi

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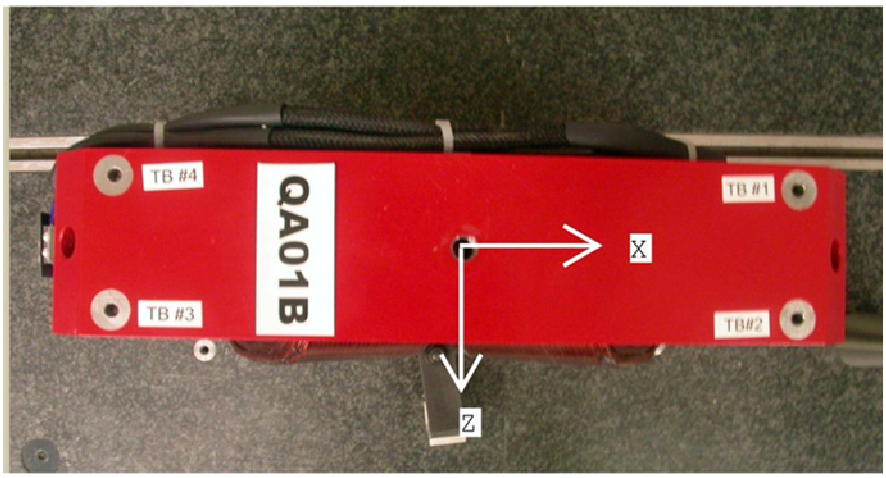
Tooling Ball Locations



Tooling Ball Locations

Tooling Ball	X Coord.	Y Coord.	Z Coord.
Ball #1	6.50054	8.88099	-1.25375
Ball #2	6.50126	8.88495	1.24455
Ball #3	-6.49978	8.88288	1.24740
Ball #4	-6.49872	8.88133	-1.25295

Tooling Ball Locations are 1 inch above unpainted surface pads

Dimensions in Inch

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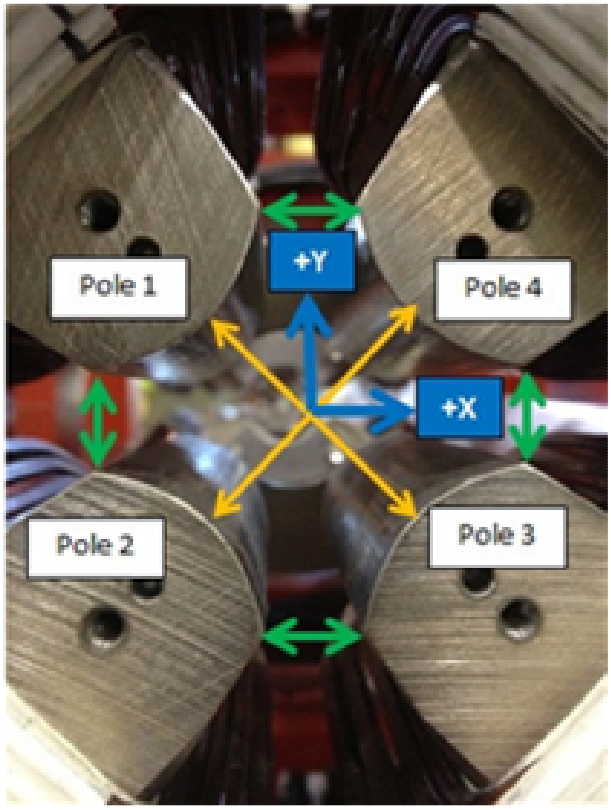
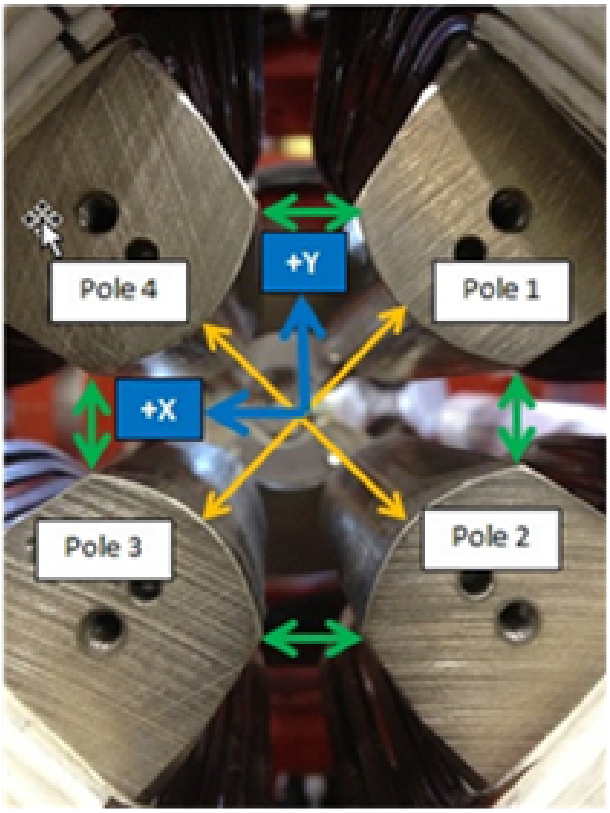
Pole Tip Gap Measurements

Pole Tips looking Downstream



Pole Tips looking Upstream



	Nominal Distance	Downstream Pole Ends	Upstream Pole Ends
Pole Tip Distance 1-3	1.260	1.2597	1.26067
Pole Tip Distance 2-4	1.260	1.26102	1.2607
Gap 1-2	.422	0.42664	0.42622
Gap 2-3	.422	0.42585	0.42443
Gap 3-4	.422	0.42419	0.42611
Gap 4-1	.422	0.41338	0.41458

Dimensions in Inch

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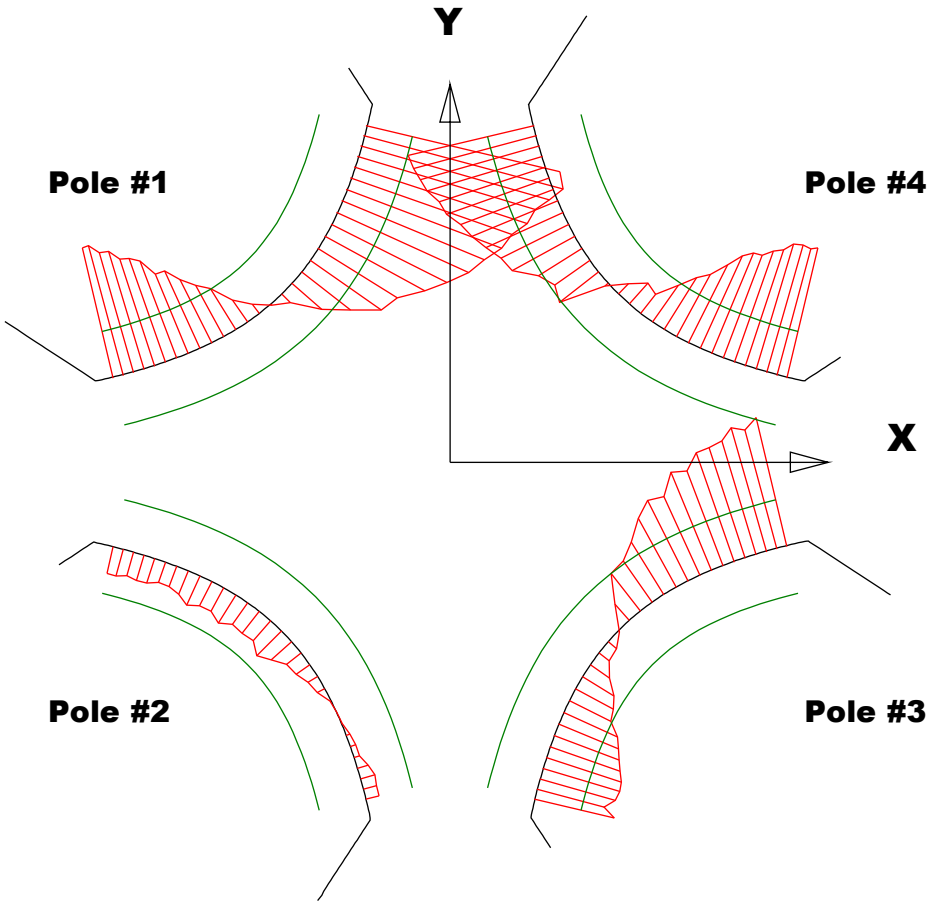
Composite Best-fit of Pole Tips, Downstream



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.	-0.0028	-0.00073	-0.00171	-0.00279
Max. Dev.	0.00431	0.00031	0.00276	0.0027

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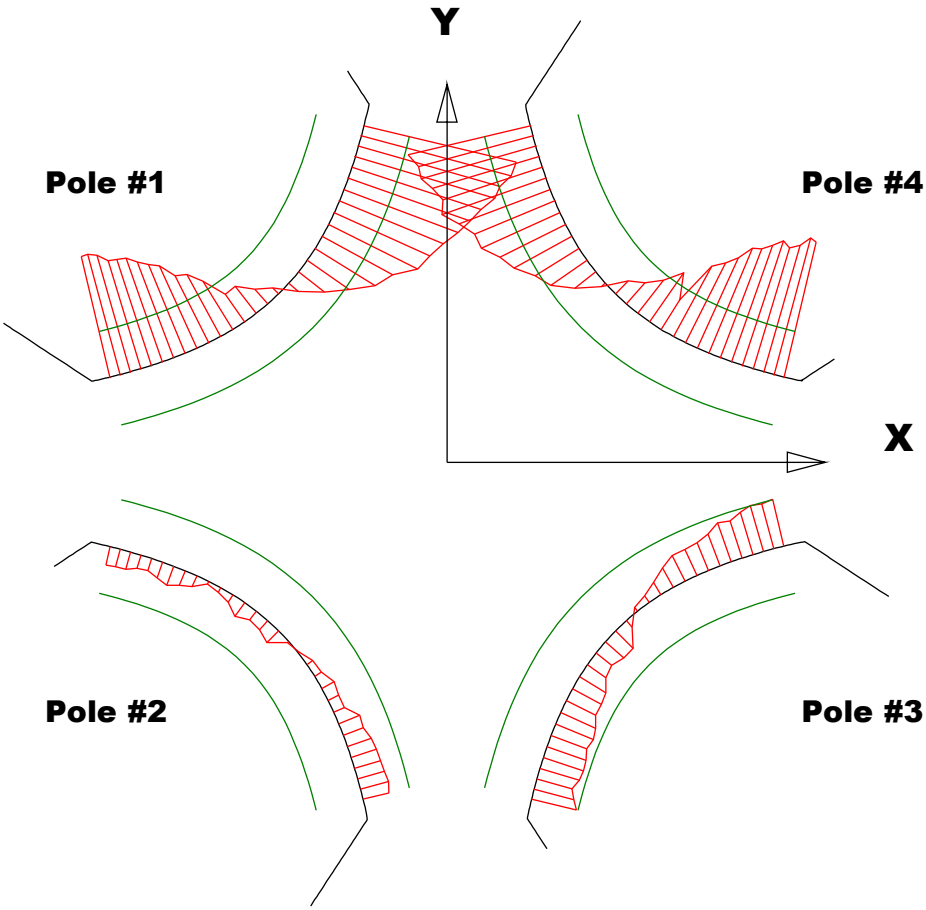
Composite Best-fit of Pole Tips, Upstream



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.	-0.00261	-0.00043	-0.00097	-0.00296
Max. Dev.	0.00329	0.00061	0.00102	0.00263

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