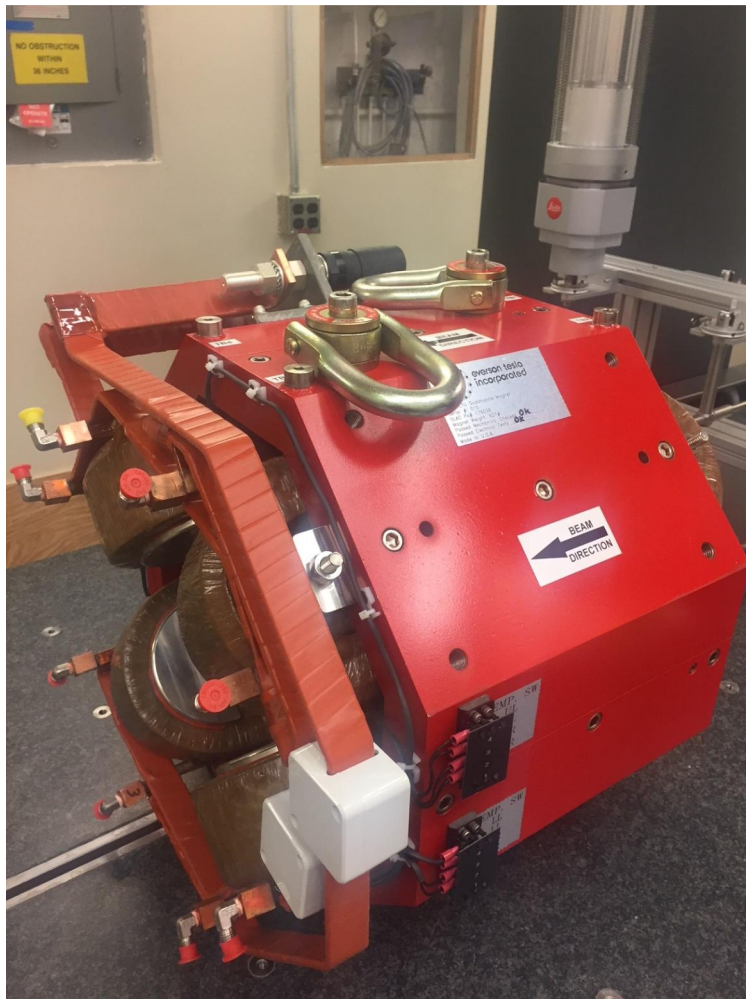


LCLS II LTU Quad Fiducialization Report

1.26Q12 Quadrupole



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-327-00 R1
Barcode # : 4059
Mfg. S/N : 021

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.

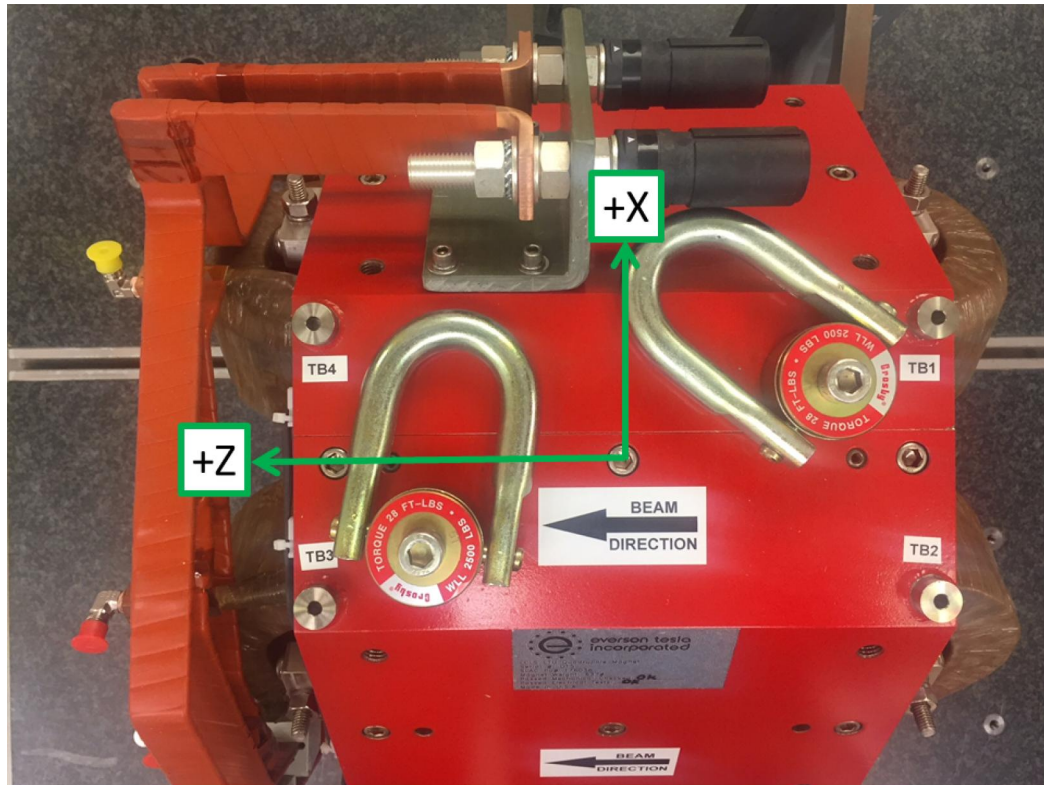
Coordinate Origins

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	-2.5135	10.2027	-5.4791
TB 2	2.5042	10.1983	-5.4851
TB 3	2.5093	10.2036	5.4662
TB 4	-2.4920	10.2035	5.4657
TB 1*	-2.5138	9.5144	-5.4829
TB 2*	2.5053	9.5111	-5.4849
TB 3*	2.5093	9.5157	5.4670
TB 4*	-2.4925	9.5156	5.4665

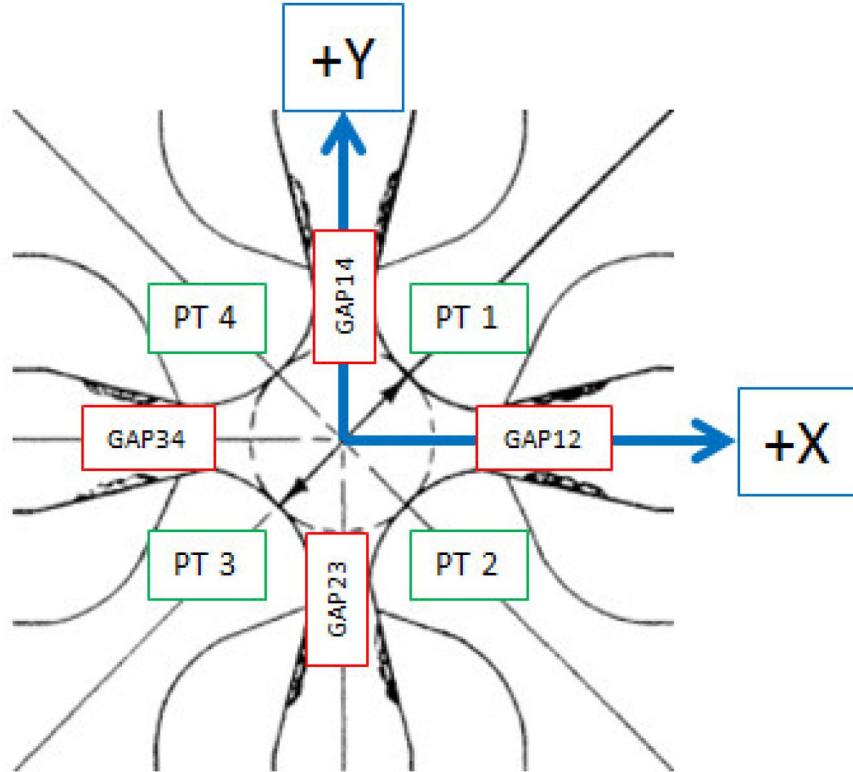
Tooling Ball (TB1-4) Locations are 1 inch above Tooling Ball Adapter Plane
 Tooling Ball (TB1*-4* Locations are 5/16 inch above Tooling Ball Adapter Plane

Dimensions in Inch

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Pole Tip Gap Measurements



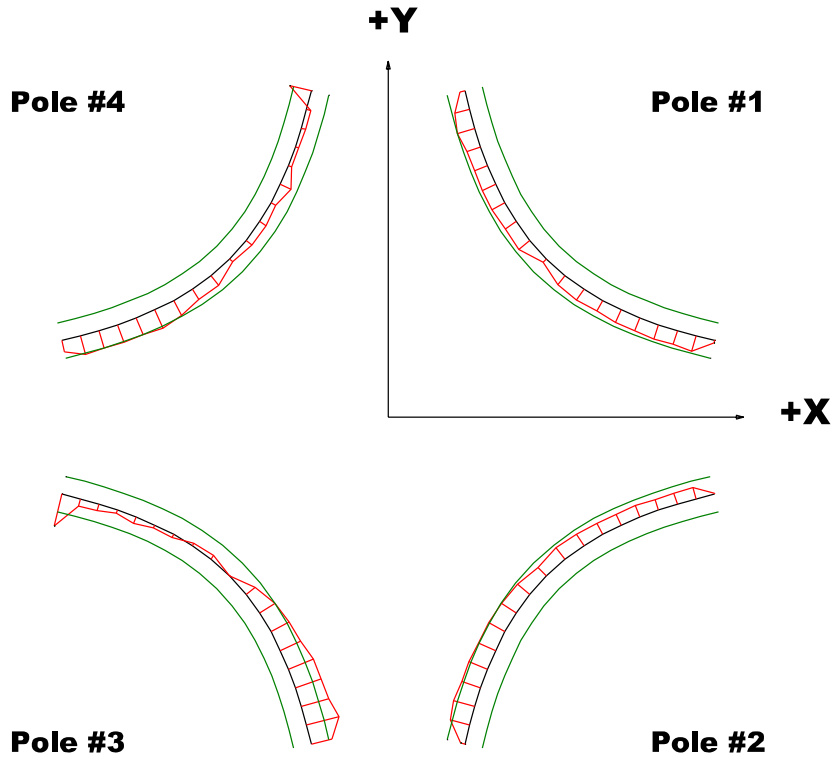
	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	1.260	1.2596	1.2594
Pole Tip Distance 2-4	1.260	1.2590	1.2588
Gap 1-2	0.432	0.4316	0.4298
Gap 2-3	0.432	0.4301	0.4343
Gap 3-4	0.432	0.4324	0.4279
Gap 4-1	0.432	0.4324	0.4340

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

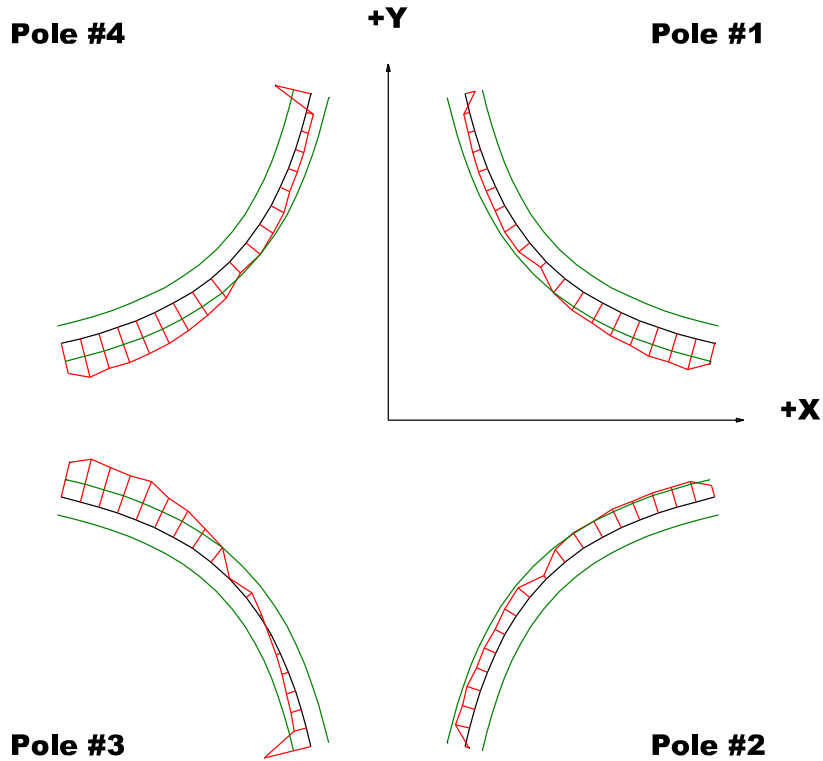
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	0.0001	0.0000	-0.0018	-0.0012
Max. Dev.	0.0010	0.0012	0.0018	0.0011

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Mfg. S/N : 021

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

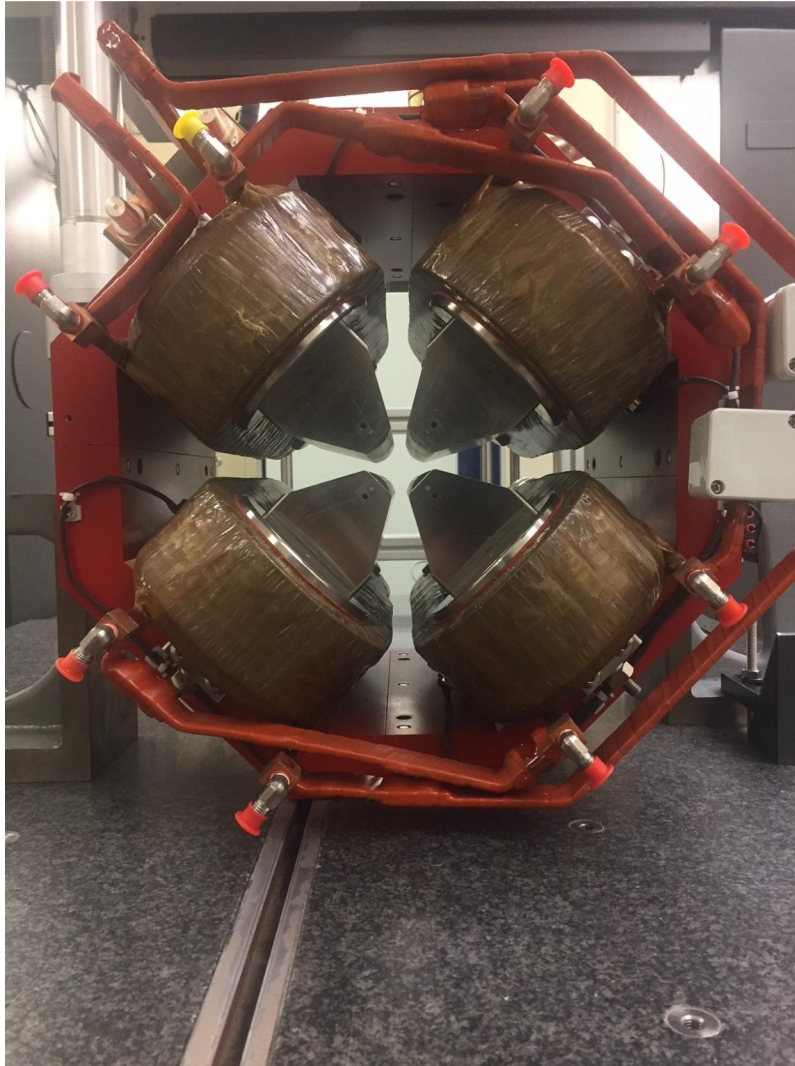
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0006	-0.0002	-0.0027	-0.0021
Max. Dev.	0.0017	0.0012	0.0024	0.0022

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Angle of the Composite Pole Tip Best-Fit In Relation to Base/CMM Granite Table



Angle in Decimal Degrees ° :-0.00996

Angle in Milliradians :-0.17382

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