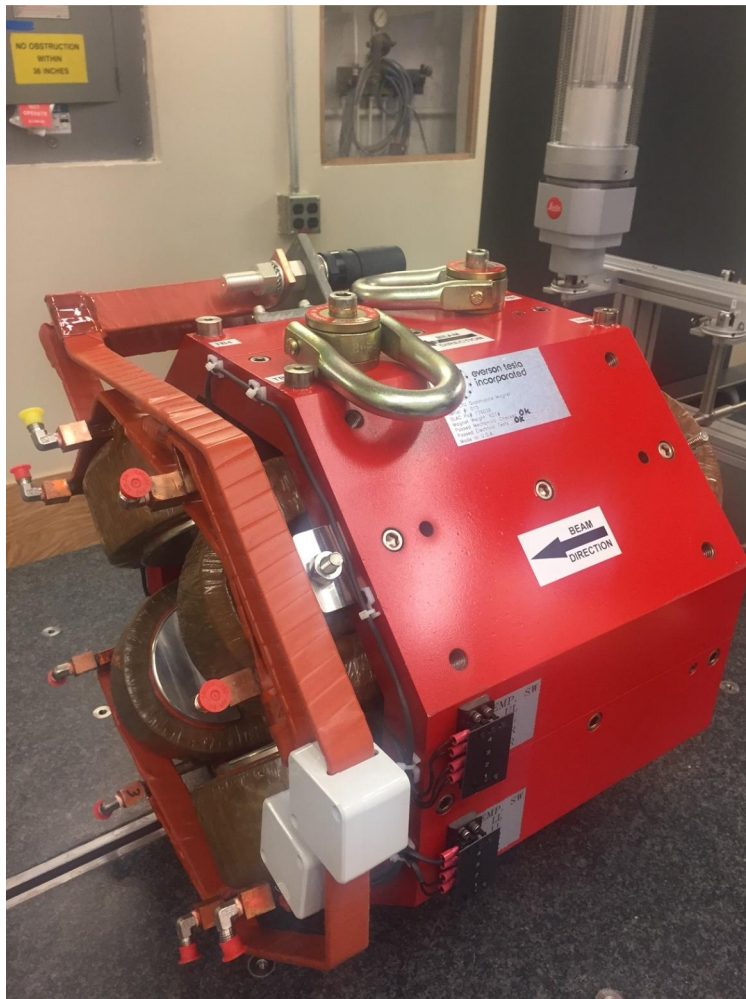


LCLS II LTU Quad Fiducialization Report

1.26Q12 Quadrupole



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-327-00 R1
Barcode # : 4055
Mfg. S/N : 017

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 ~ 0.250 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.

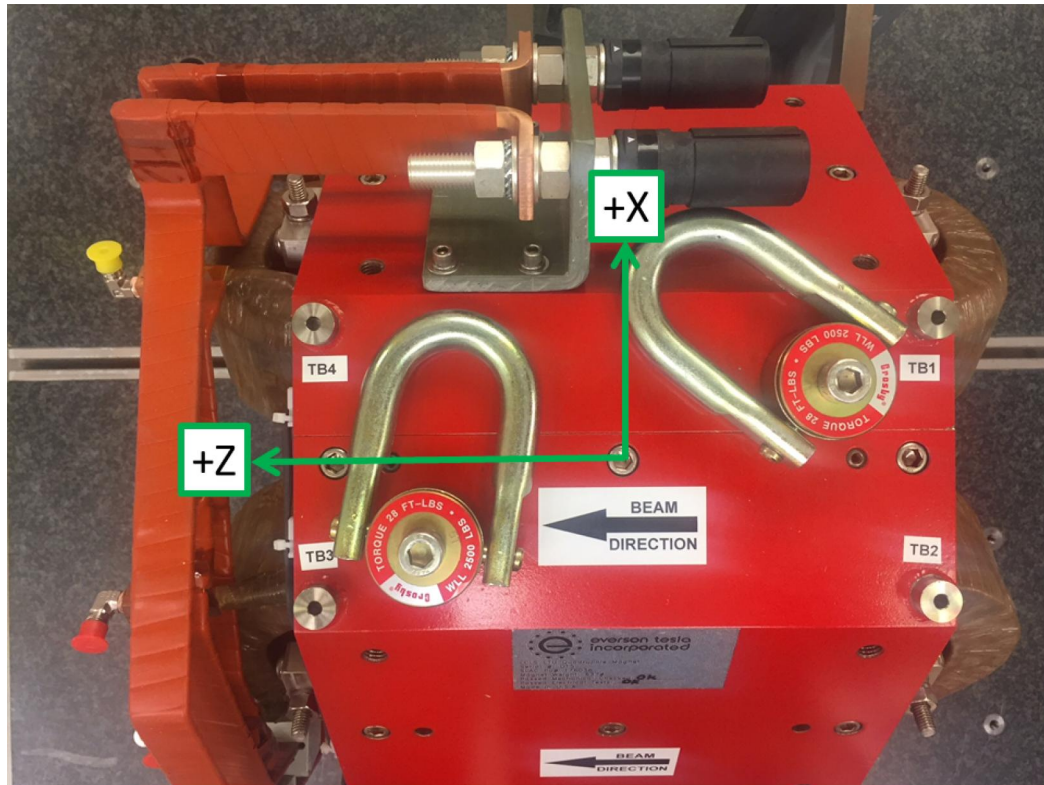
Coordinate Origins

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	-2.5191	10.2010	-5.4792
TB 2	2.4844	10.2025	-5.4922
TB 3	2.5064	10.2014	5.4762
TB 4	-2.4890	10.2010	5.4896
TB 1*	-2.5192	9.5135	-5.4792
TB 2*	2.4854	9.5149	-5.4924
TB 3*	2.5063	9.5143	5.4766
TB 4*	-2.4897	9.5127	5.4896

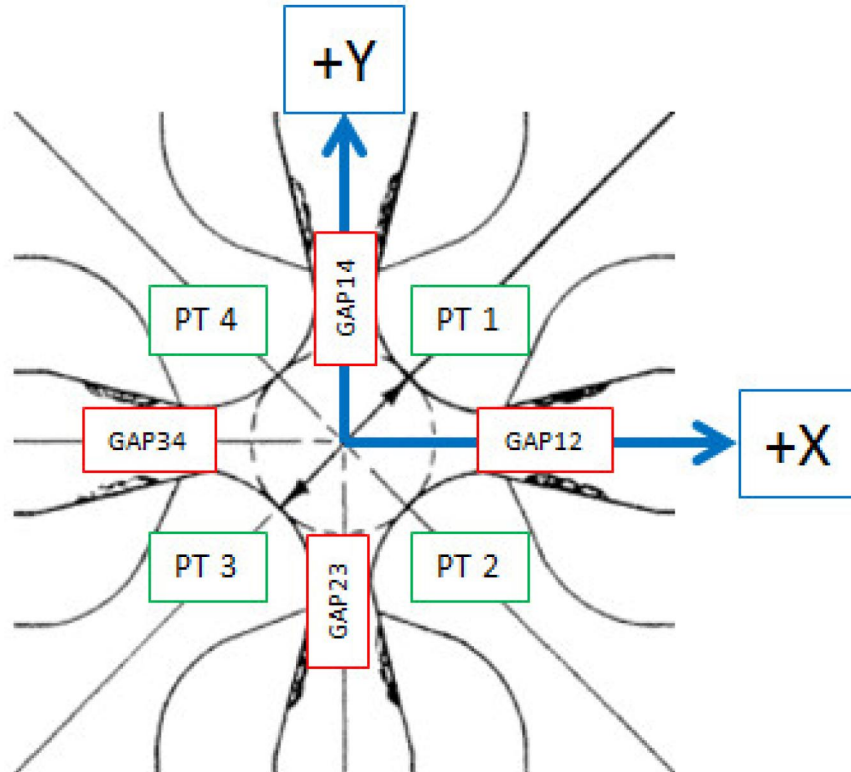
Tooling Ball (TB1-4) Locations are 1 inch above Tooling Ball Adapter Plane
 Tooling Ball (TB1*-4* Locations are 5/16 inch above Tooling Ball Adapter Plane

Dimensions in Inch

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Pole Tip Gap Measurements



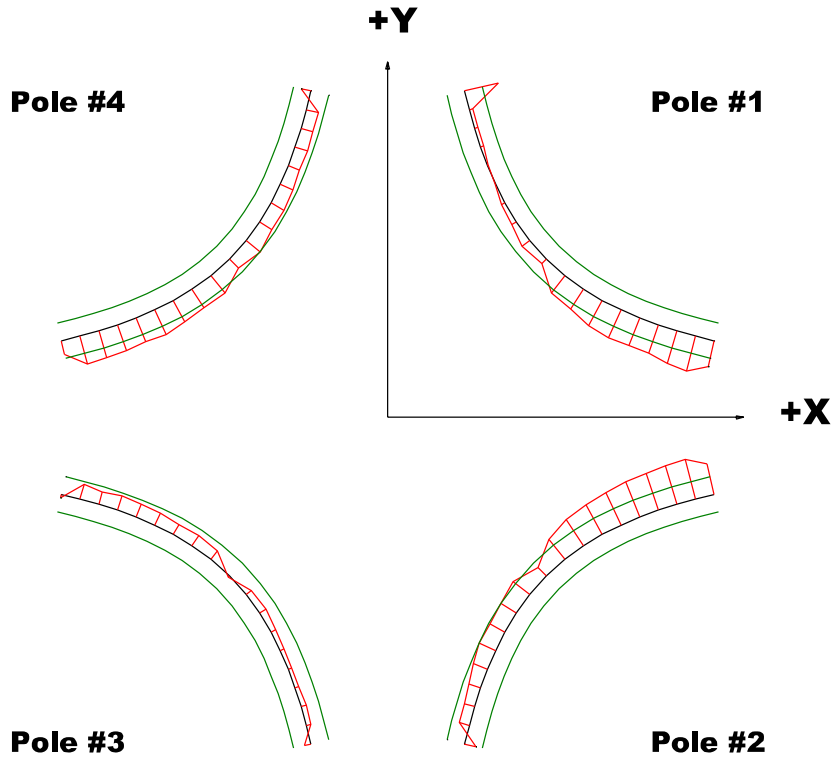
	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	1.260	1.2596	1.2609
Pole Tip Distance 2-4	1.260	1.2585	1.2599
Gap 1-2	0.432	0.4283	0.4282
Gap 2-3	0.432	0.4326	0.4320
Gap 3-4	0.432	0.4309	0.4314
Gap 4-1	0.432	0.4338	0.4339

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

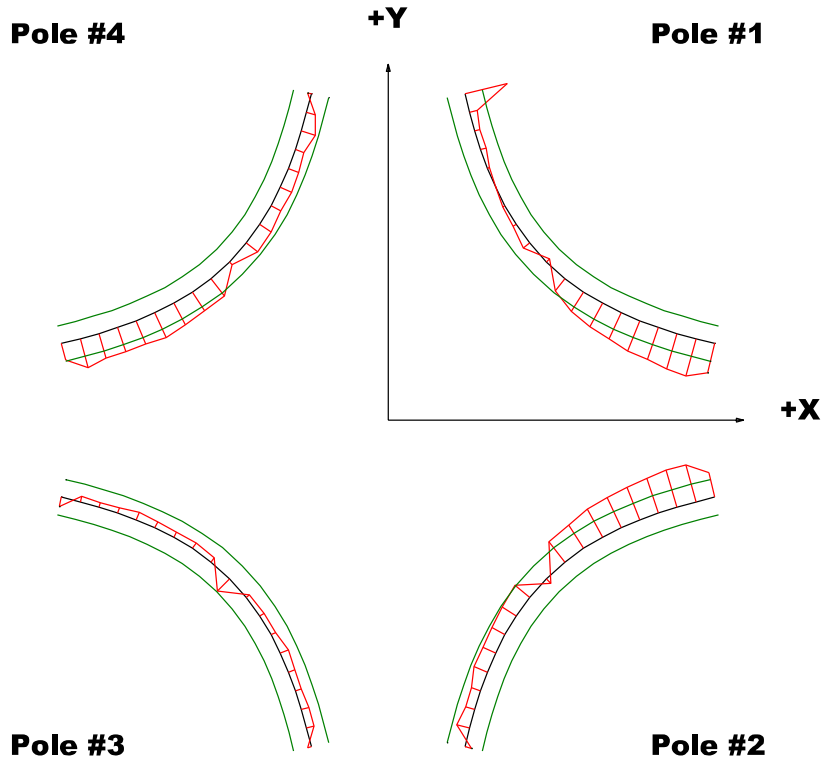
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0019	-0.0006	-0.0004	-0.0005
Max. Dev.	0.0020	0.0023	0.0009	0.0016

Barcode # : 4055

Mfg. S/N : 017

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

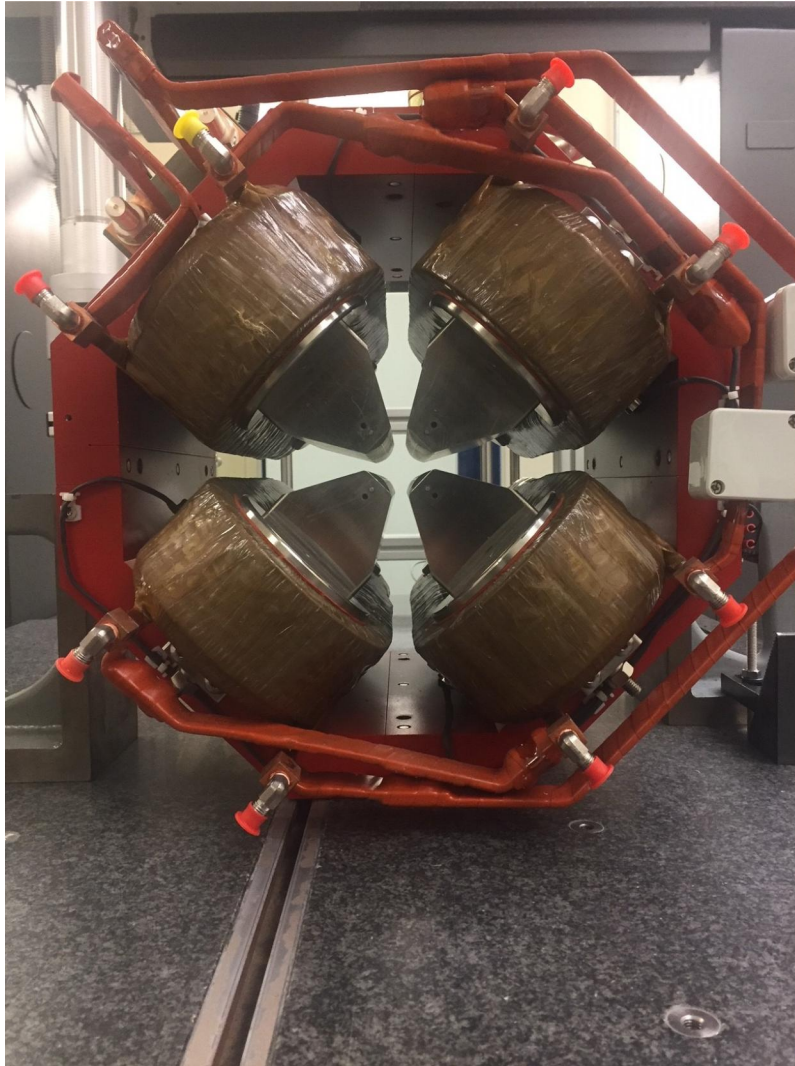
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0024	-0.0004	-0.0010	-0.0002
Max. Dev.	0.0021	0.0021	0.0005	0.0017

Barcode # : 4055

Mfg. S/N : 017

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



Angle in Decimal Degrees ° :-0.01550

Angle in Milliradians :-0.27053

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