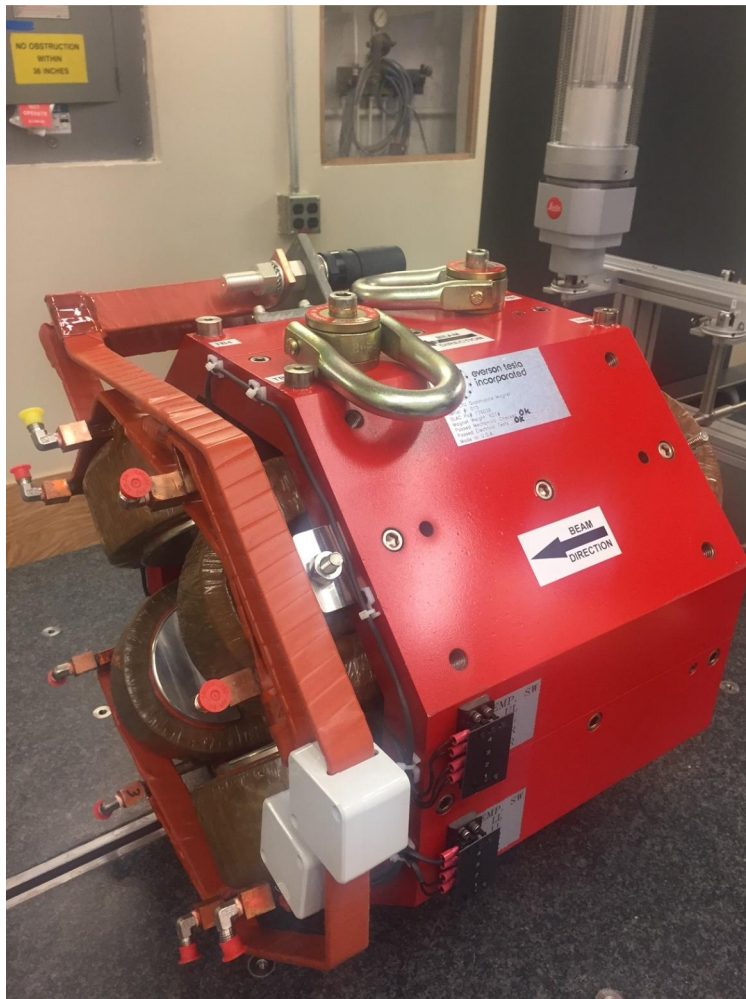


LCLS II LTU Quad Fiducialization Report

1.26Q12 Quadrupole



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-327-00 R1
Barcode # : 4060
Mfg. S/N : 020

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.

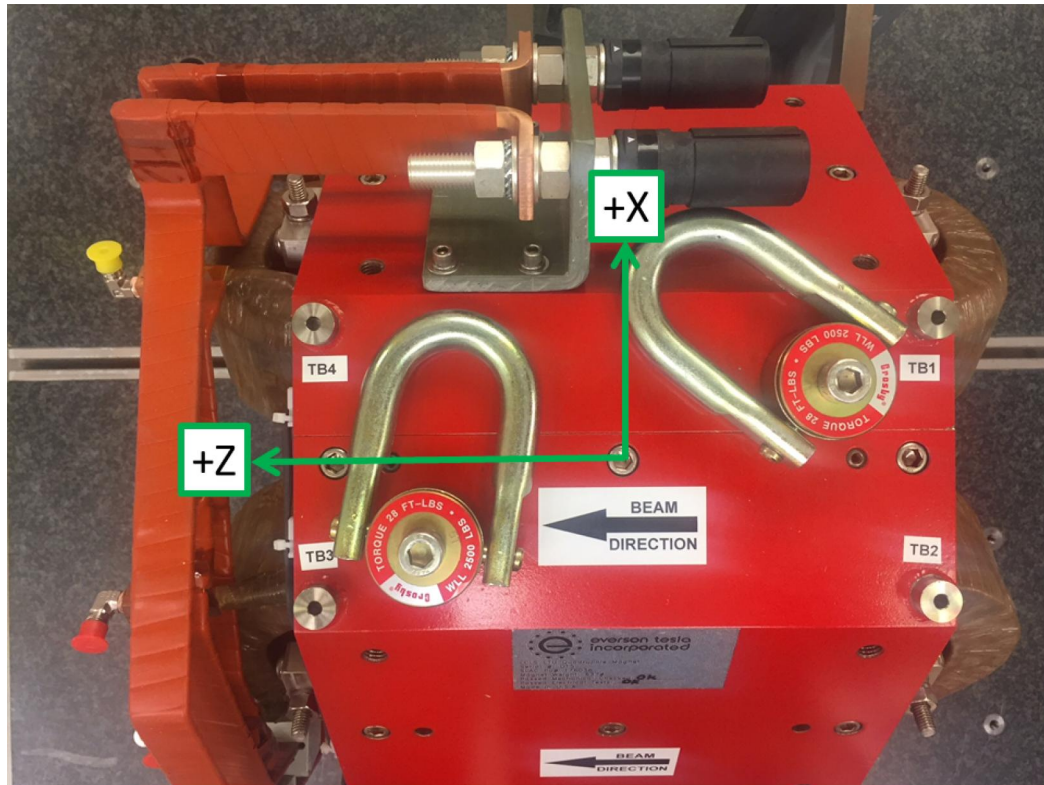
Coordinate Origins

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	-2.5011	10.1998	-5.4857
TB 2	2.4988	10.1993	-5.4869
TB 3	2.5072	10.1997	5.4858
TB 4	-2.4948	10.1984	5.4862
TB 1*	-2.5024	9.5118	-5.4863
TB 2*	2.5005	9.5111	-5.4870
TB 3*	2.5067	9.5122	5.4862
TB 4*	-2.4965	9.5111	5.4864

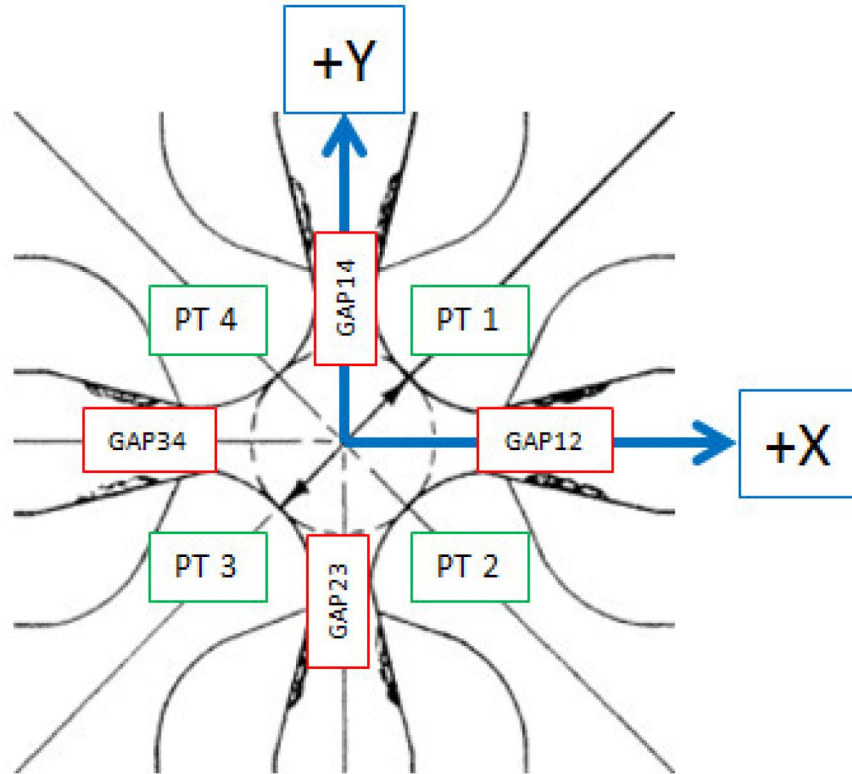
Tooling Ball (TB1-4) Locations are 1 inch above Tooling Ball Adapter Plane
 Tooling Ball (TB1*-4* Locations are 5/16 inch above Tooling Ball Adapter Plane

Dimensions in Inch

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Pole Tip Gap Measurements



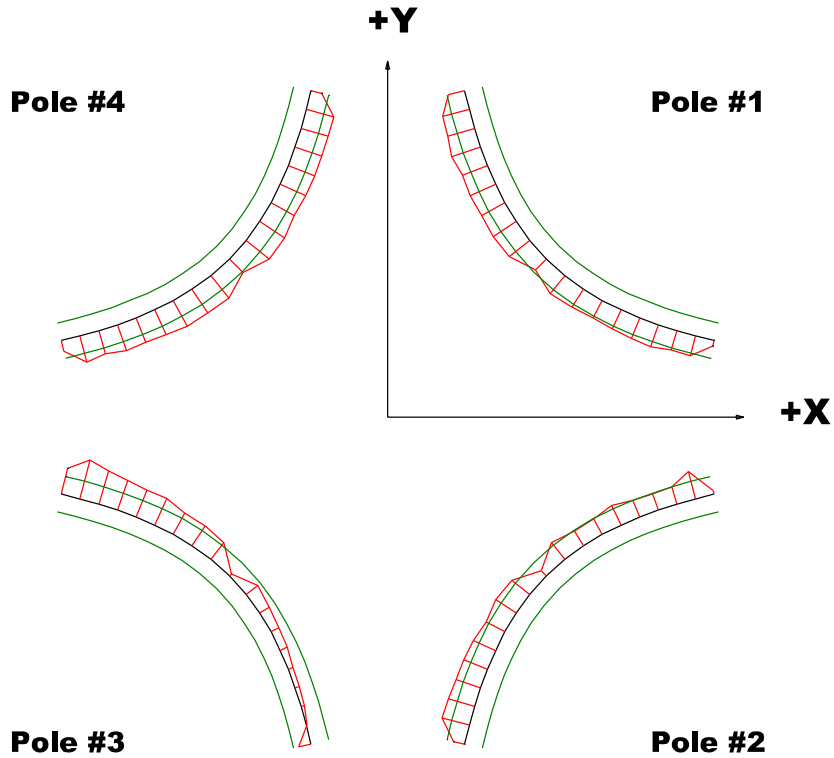
	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	1.260	1.2588	1.2601
Pole Tip Distance 2-4	1.260	1.2583	1.2600
Gap 1-2	0.432	0.4309	0.4296
Gap 2-3	0.432	0.4317	0.4363
Gap 3-4	0.432	0.4294	0.4301
Gap 4-1	0.432	0.4302	0.4336

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

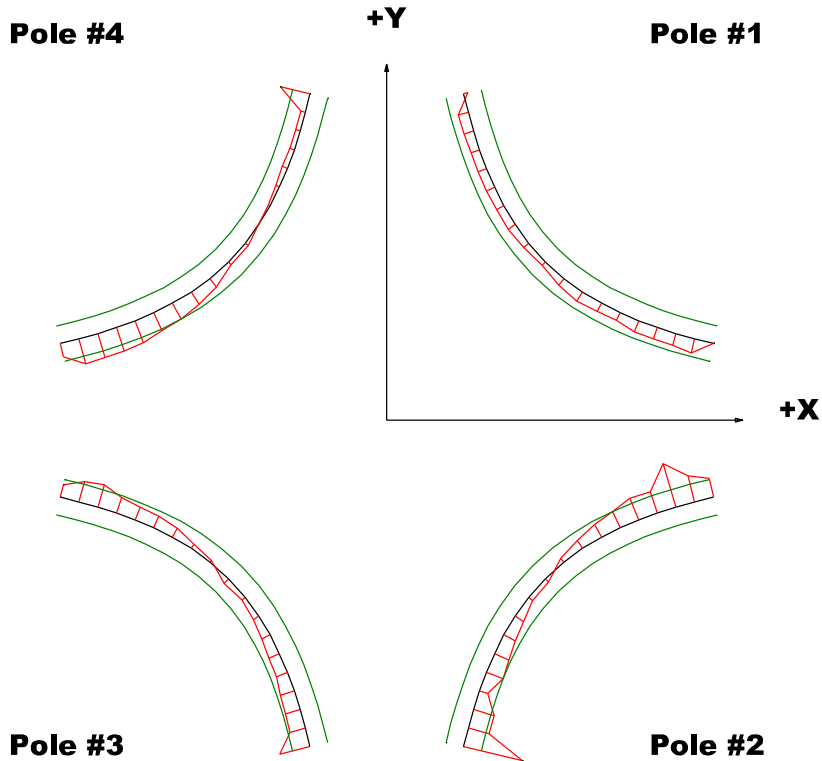
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	0.0003	0.0002	-0.0007	0.0006
Max. Dev.	0.0017	0.0016	0.0022	0.0016

Barcode # : 4060

Mfg. S/N : 020

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

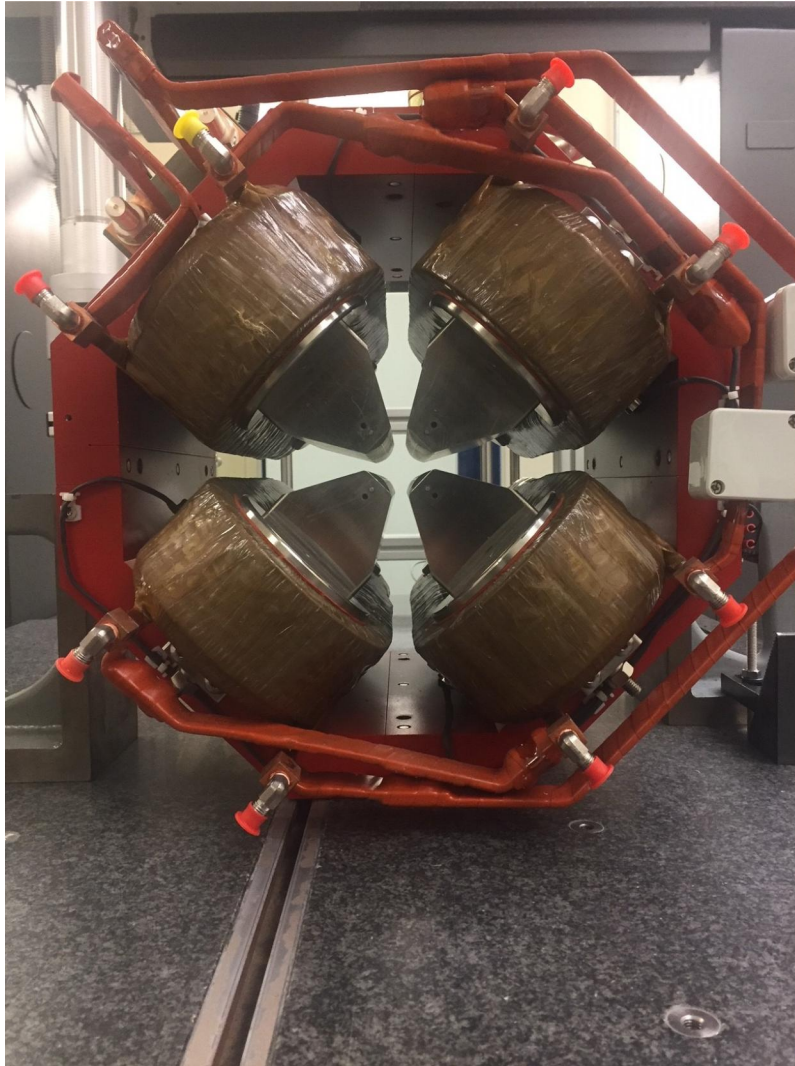
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0003	-0.0033	-0.0017	-0.0017
Max. Dev.	0.0008	0.0025	0.0013	0.0014

Barcode # : 4060

Mfg. S/N : 020

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



Angle in Decimal Degrees ° :0.03754

Angle in Milliradians :0.65514

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