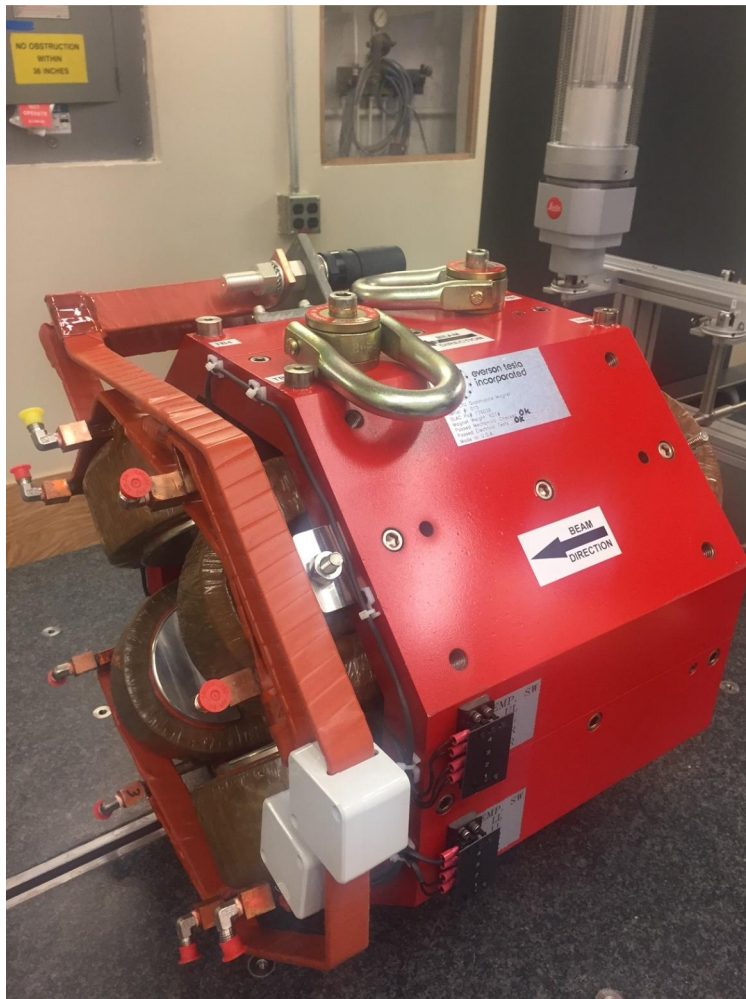


LCLS II LTU Quad Fiducialization Report

1.26Q12 Quadrupole



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-327-00 R1
Barcode # : 4063
Mfg. S/N : 024

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.

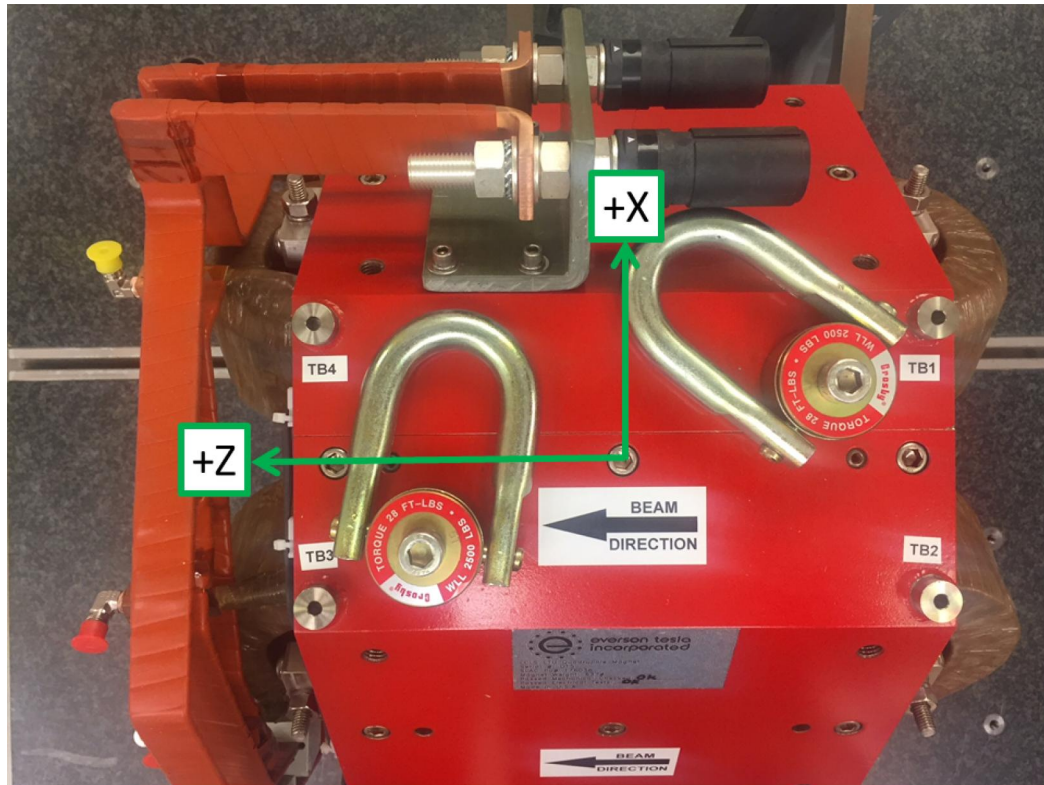
Coordinate Origins

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.

Barcode # : 4063

Mfg. S/N : 024

Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-2.4953	10.1995	-5.4904
TB 2	2.5109	10.2036	-5.4818
TB 3	2.5018	10.2087	5.4730
TB 4	-2.5066	10.2026	5.4756
TB 1*	-2.4971	9.5116	-5.4902
TB 2*	2.5105	9.5162	-5.4825
TB 3*	2.5001	9.5206	5.4731
TB 4*	-2.5083	9.5151	5.4762

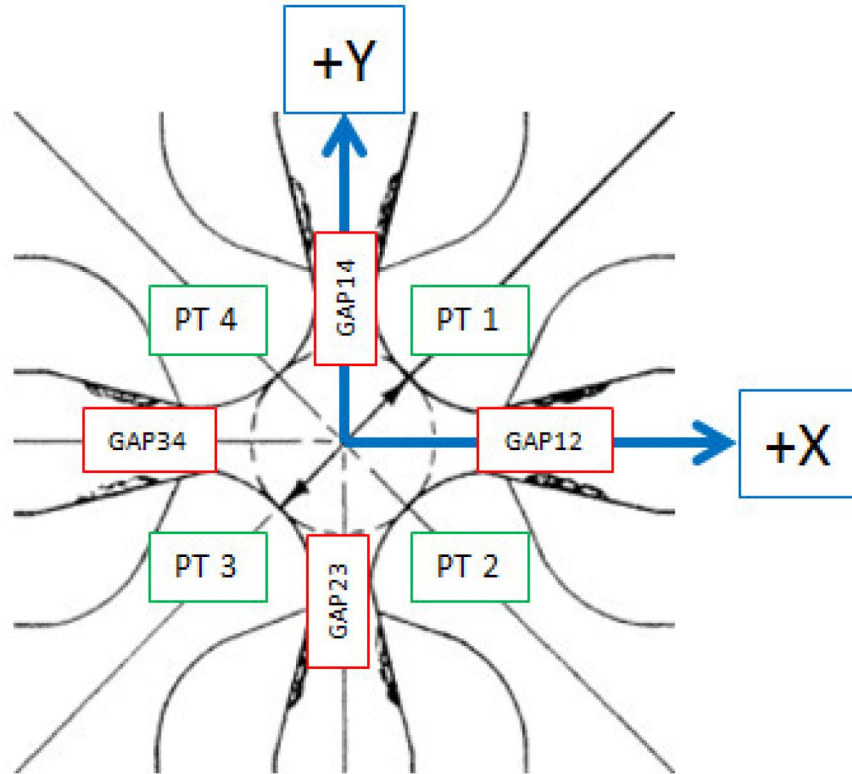
Tooling Ball (TB1-4) Locations are 1 inch above Tooling Ball Adapter Plane
 Tooling Ball (TB1*-4* Locations are 5/16 inch above Tooling Ball Adapter Plane

Dimensions in Inch

Barcode # : 4063

Mfg. S/N : 024

Pole Tip Gap Measurements



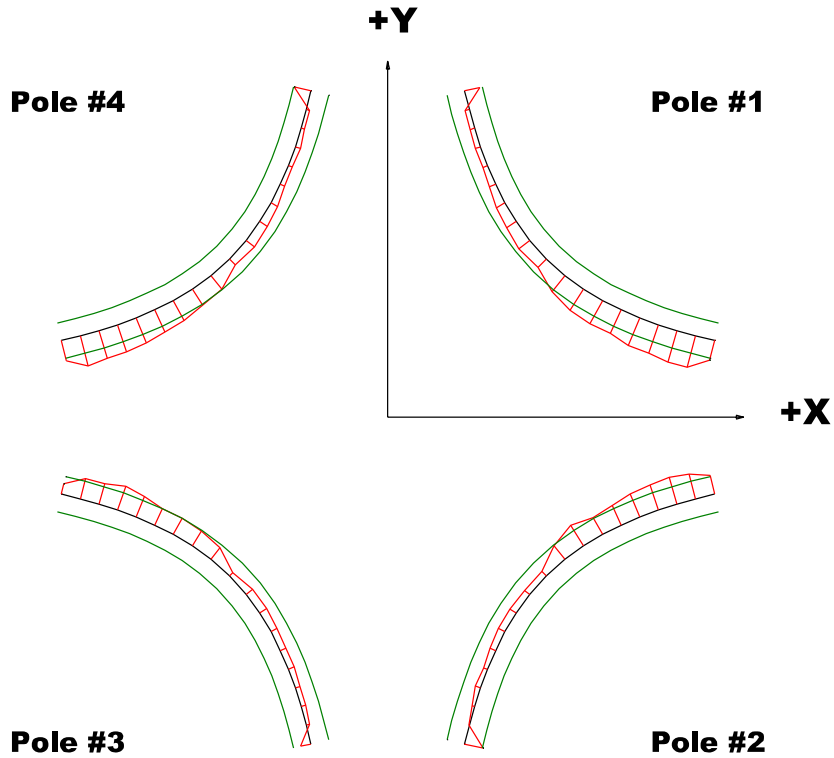
	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	1.260	1.2590	1.2592
Pole Tip Distance 2-4	1.260	1.2591	1.2588
Gap 1-2	0.432	0.4296	0.4292
Gap 2-3	0.432	0.4333	0.4329
Gap 3-4	0.432	0.4300	0.4276
Gap 4-1	0.432	0.4333	0.4330

Dimensions in Inch

Barcode # : 4063

Mfg. S/N : 024

Composite Best-fit of Pole Tips, Downstream



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

Dimensions in Inch

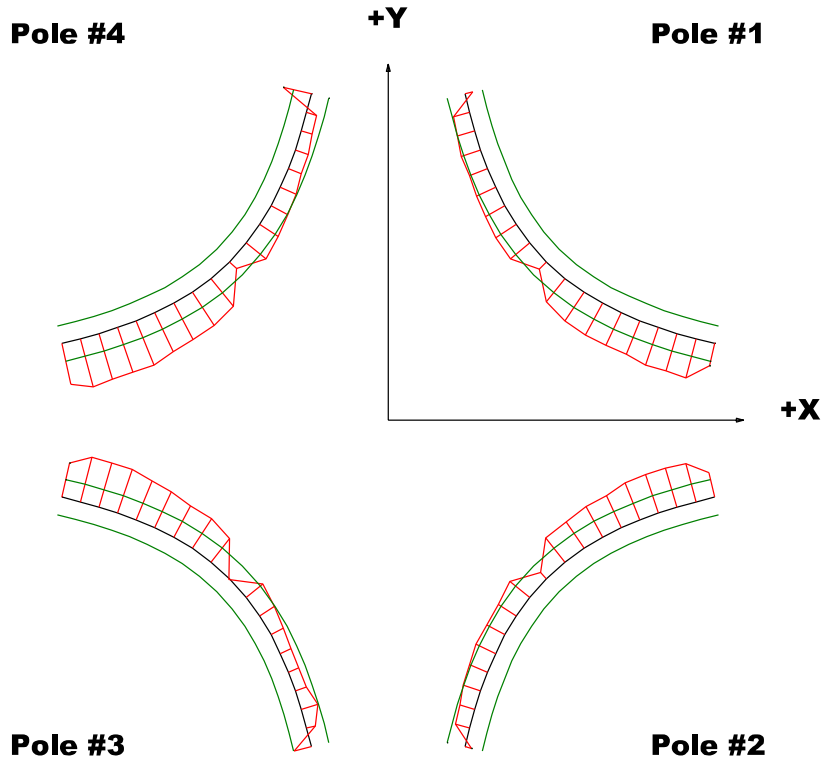
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0009	-0.0010	-0.0006	-0.0010
Max. Dev.	0.0018	0.0015	0.0014	0.0017

Barcode # : 4063

Mfg. S/N : 024

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

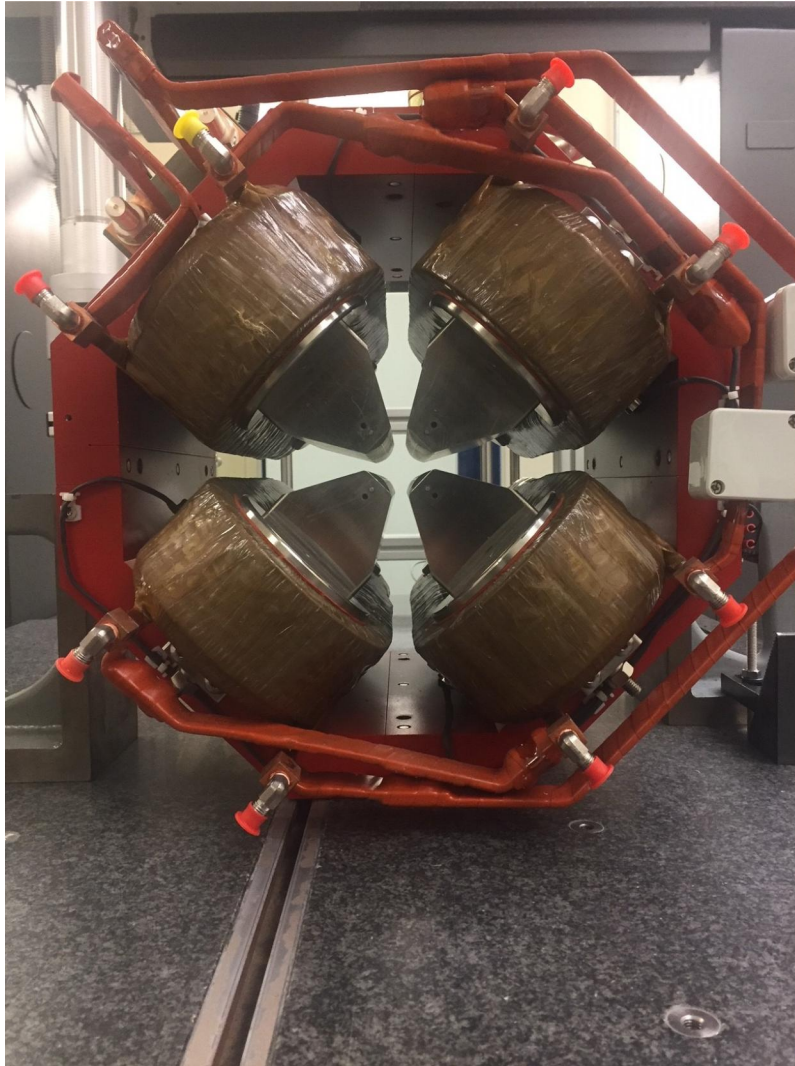
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0004	-0.0004	-0.0010	-0.0016
Max. Dev.	0.0022	0.0022	0.0025	0.0027

Barcode # : 4063

Mfg. S/N : 024

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



Angle in Decimal Degrees ° :-0.01119

Angle in Milliradians :-0.19528

Barcode # : 4063

Mfg. S/N : 024