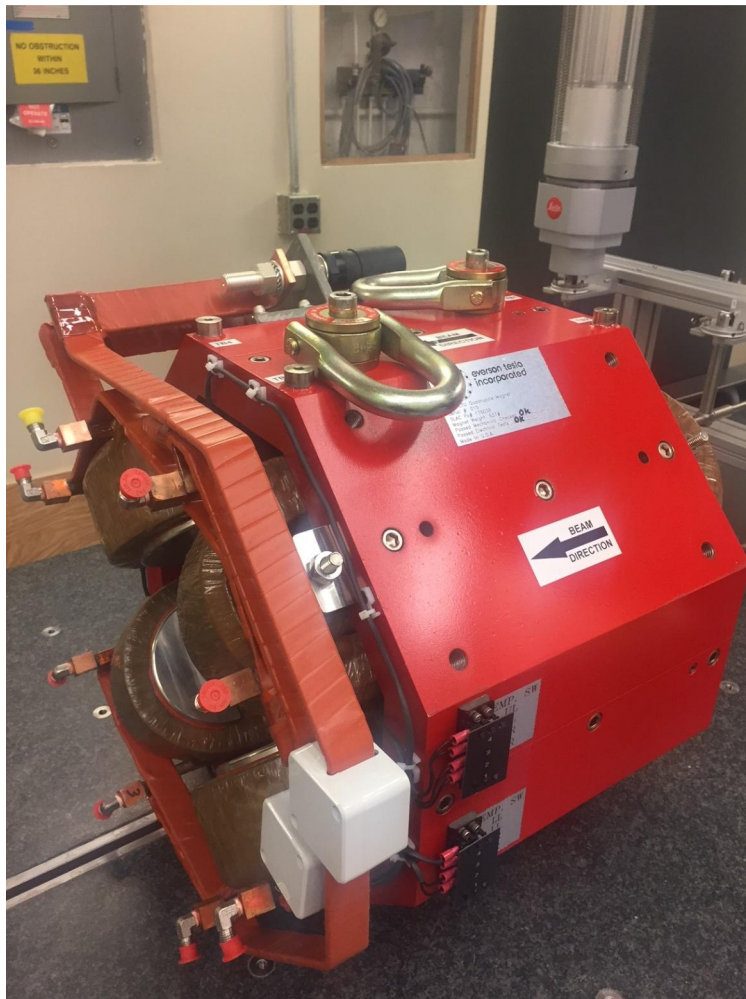


LCLS II LTU Quad Fiducialization Report

1.26Q12 Quadrupole



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-327-00 R1
Barcode # : 4061
Mfg. S/N : 022

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.

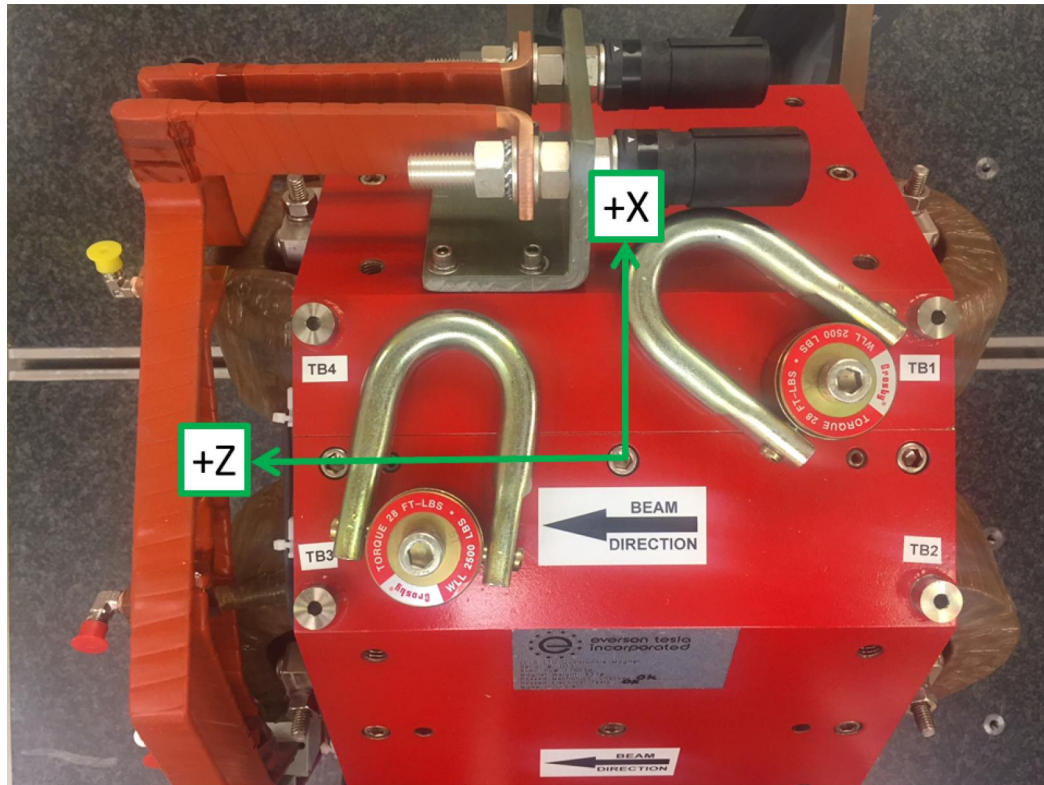
Coordinate Origins

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 # : 4061

Mfg. S/N : 022

Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-2.5024	10.2017	-5.4874
TB 2	2.4977	10.1998	-5.4904
TB 3	2.4902	10.2031	5.4864
TB 4	-2.5026	10.2000	5.4844
TB 1*	-2.5029	9.5144	-5.4870
TB 2*	2.4985	9.5120	-5.4898
TB 3*	2.4909	9.5156	5.4863
TB 4*	-2.5021	9.5117	5.4837

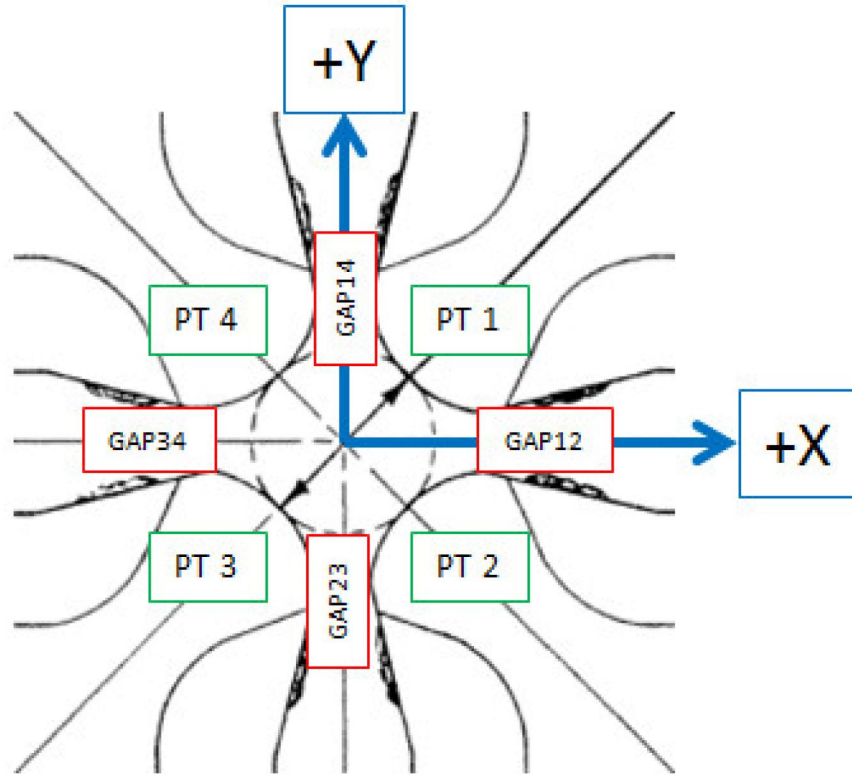
Tooling Ball (TB1-4) Locations are 1 inch above Tooling Ball Adapter Plane
 Tooling Ball (TB1*-4* Locations are 5/16 inch above Tooling Ball Adapter Plane

Dimensions in Inch

Barcode # : 4061

Mfg. S/N : 022

Pole Tip Gap Measurements



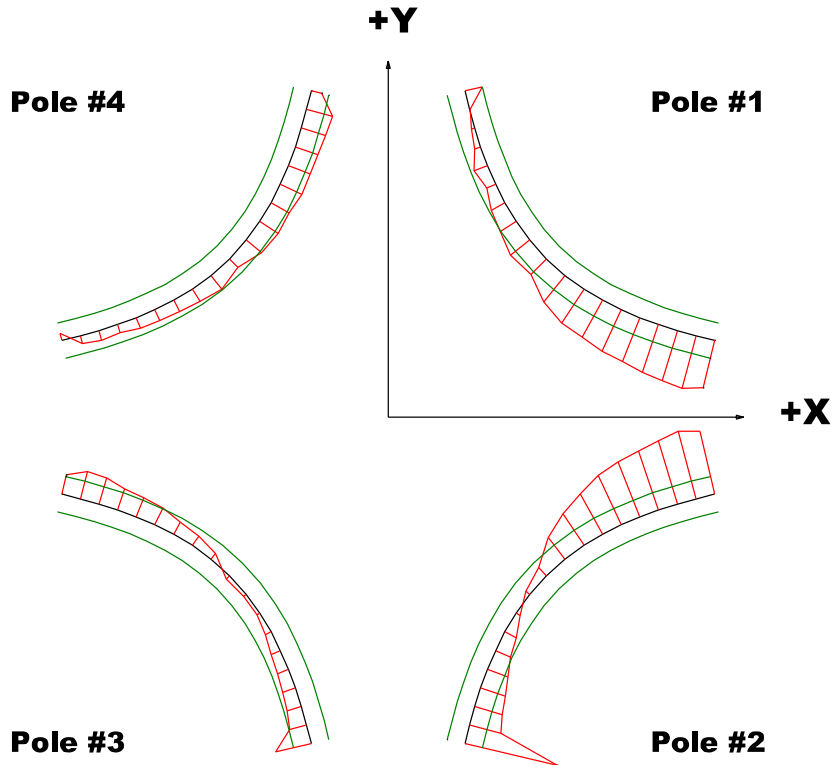
	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	1.260	1.2589	1.2585
Pole Tip Distance 2-4	1.260	1.2586	1.2591
Gap 1-2	0.432	0.4249	0.4253
Gap 2-3	0.432	0.4375	0.4398
Gap 3-4	0.432	0.4308	0.4297
Gap 4-1	0.432	0.4323	0.4329

Dimensions in Inch

Barcode # : 4061

Mfg. S/N : 022

Composite Best-fit of Pole Tips, Downstream



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

Dimensions in Inch

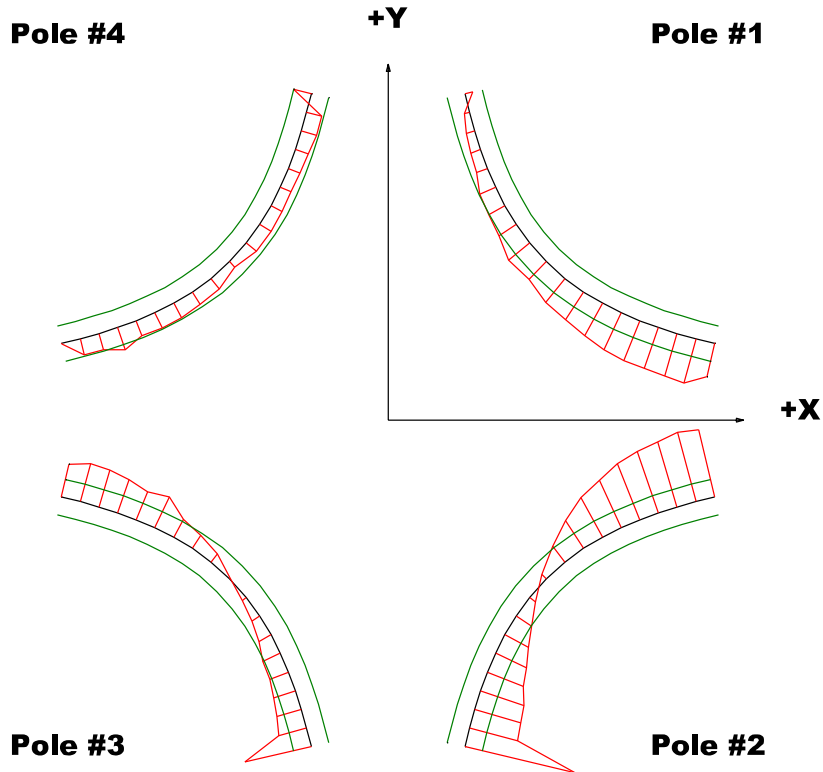
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0010	-0.0053	-0.0020	-0.0004
Max. Dev.	0.0030	0.0039	0.0016	0.0015

Barcode # : 4061

Mfg. S/N : 022

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

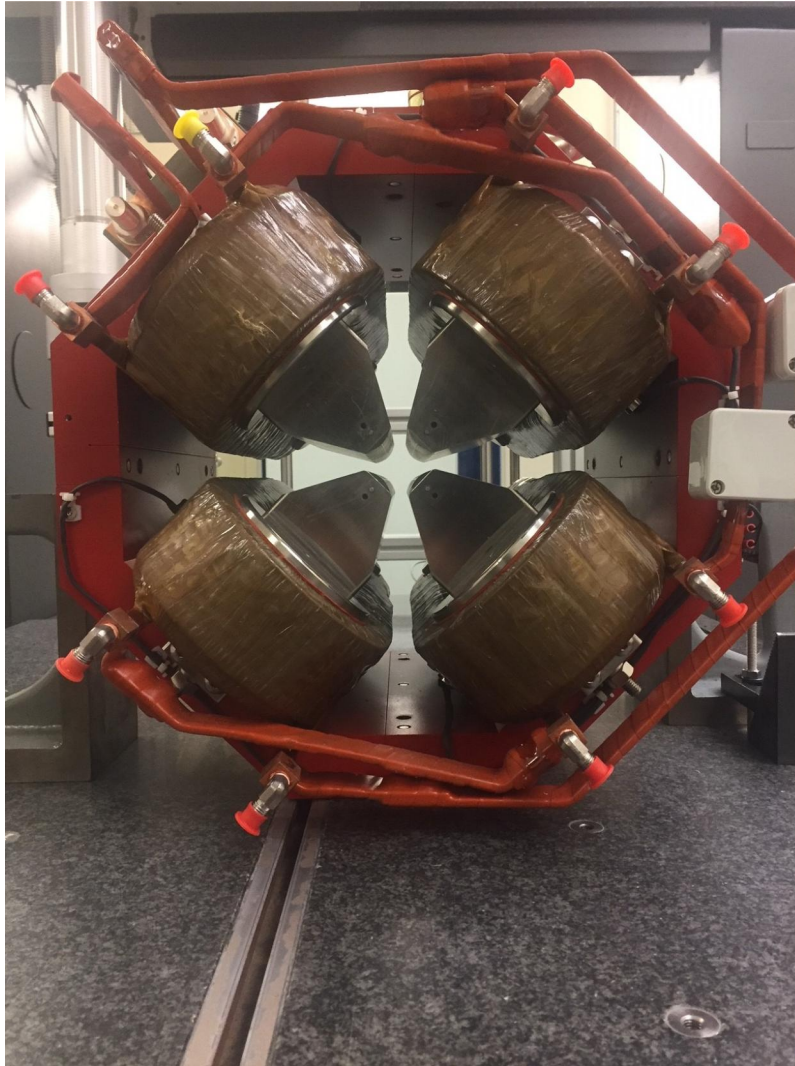
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0005	-0.0063	-0.0037	-0.0010
Max. Dev.	0.0026	0.0040	0.0022	0.0013

Barcode # : 4061

Mfg. S/N : 022

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



Angle in Decimal Degrees ° :0.01319

Angle in Milliradians :0.23017

Barcode # : 4061

Mfg. S/N : 022