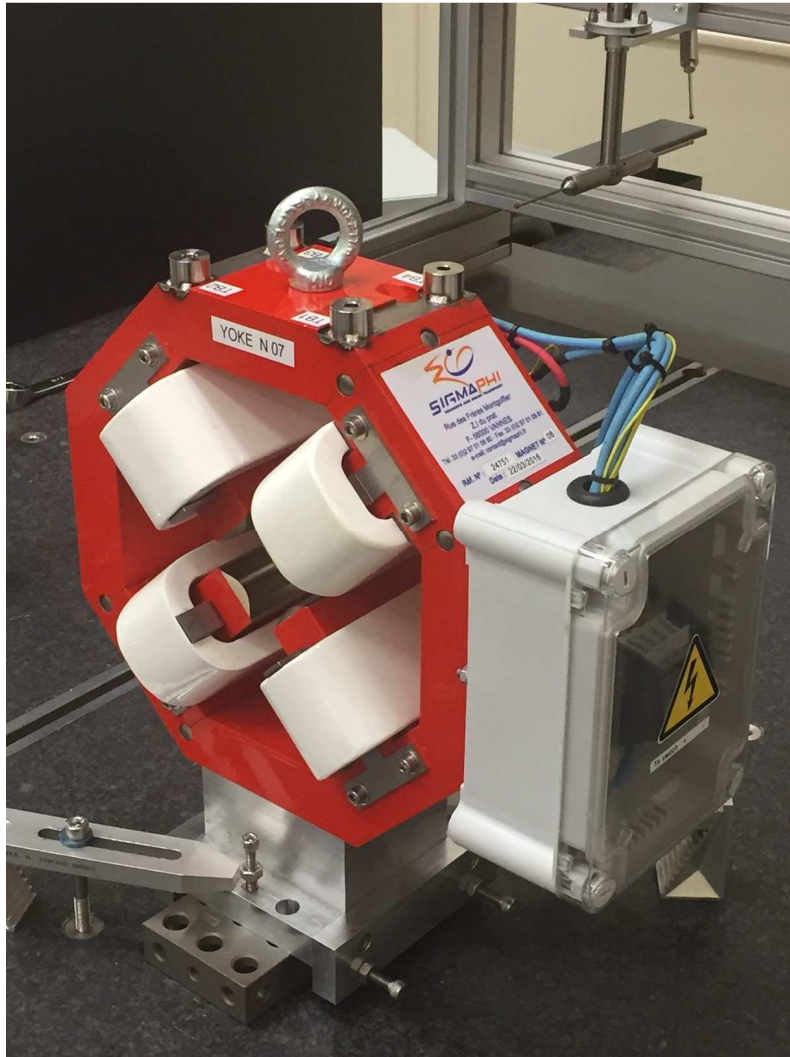


LCLS II Tweaker Quadrupole Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-702-28
Barcode # : 4102
Mfg. S/N : 05

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 .300 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.

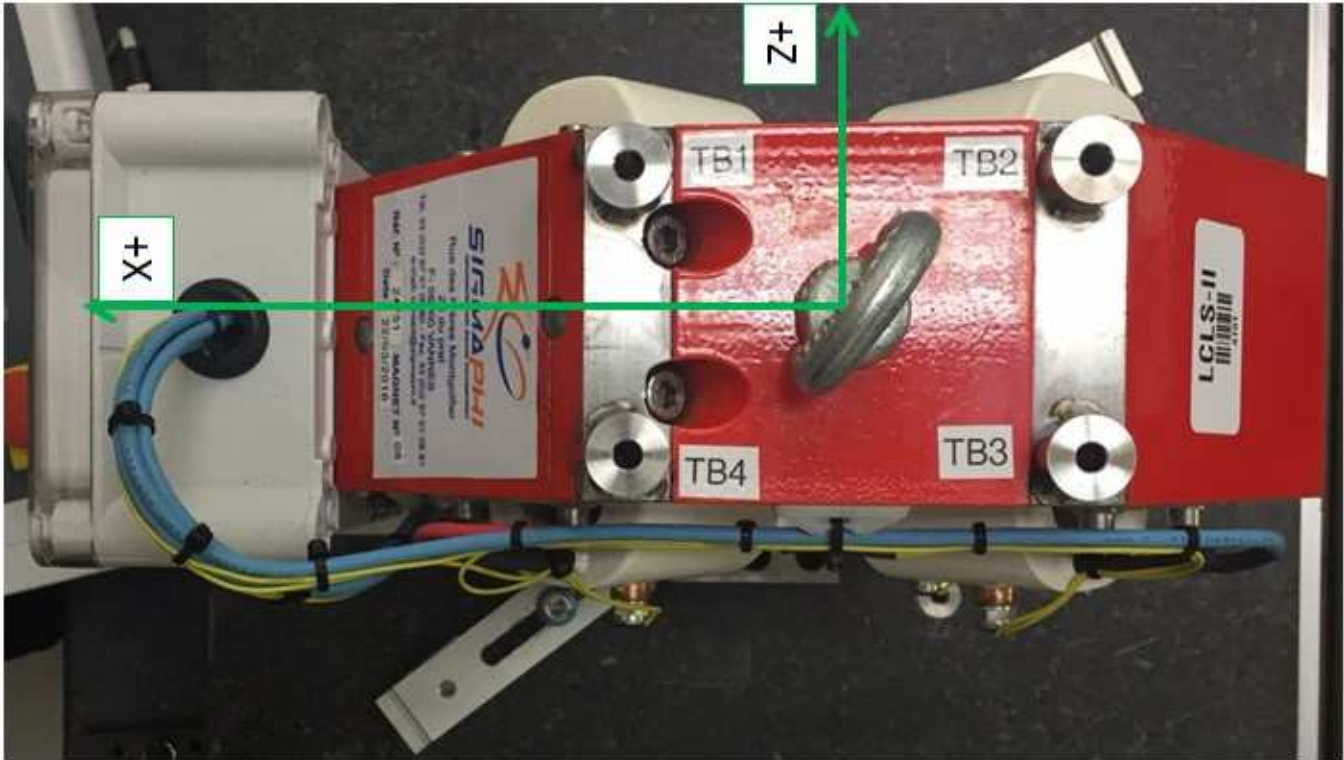
Coordinate Origins

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



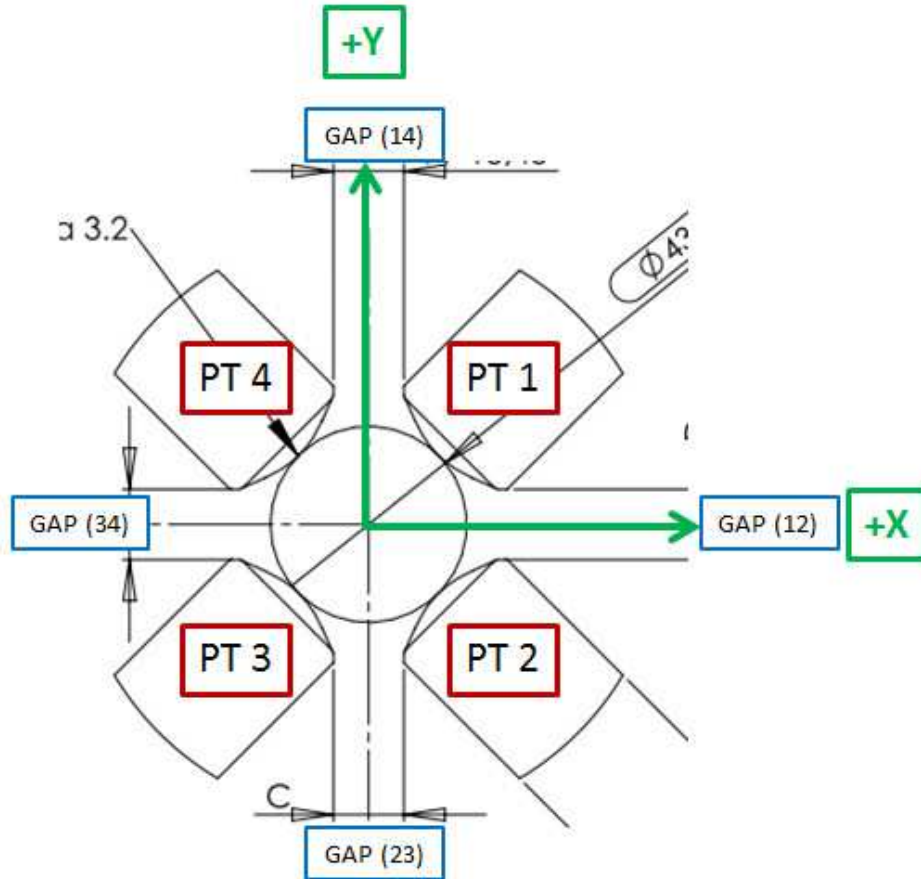
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	1.97317	6.73929	1.26068
TB 2	-1.96003	6.73944	1.25943
TB 3	-1.96948	6.73832	-1.26249
TB 4	1.97648	6.73778	-1.25972
TB A	1.97345	6.05028	1.26022
TB B	-1.96049	6.05088	1.25960
TB C	-1.96921	6.04931	-1.26291
TB D	1.97567	6.04902	-1.25980

Tooling Ball Locations (1-5) are 1 inch above Tooling Ball Adapter Plane
 Tooling Ball Locations (A-E) 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	1.693	1.69472	1.69404
Pole Tip Distance 2-4	1.693	1.69187	1.69226
Gap 1-2	0.6075	0.60619	0.60499
Gap 2-3	0.6075	0.60712	0.60698
Gap 3-4	0.6075	0.6063	0.606
Gap 4-1	0.6075	0.60726	0.60722

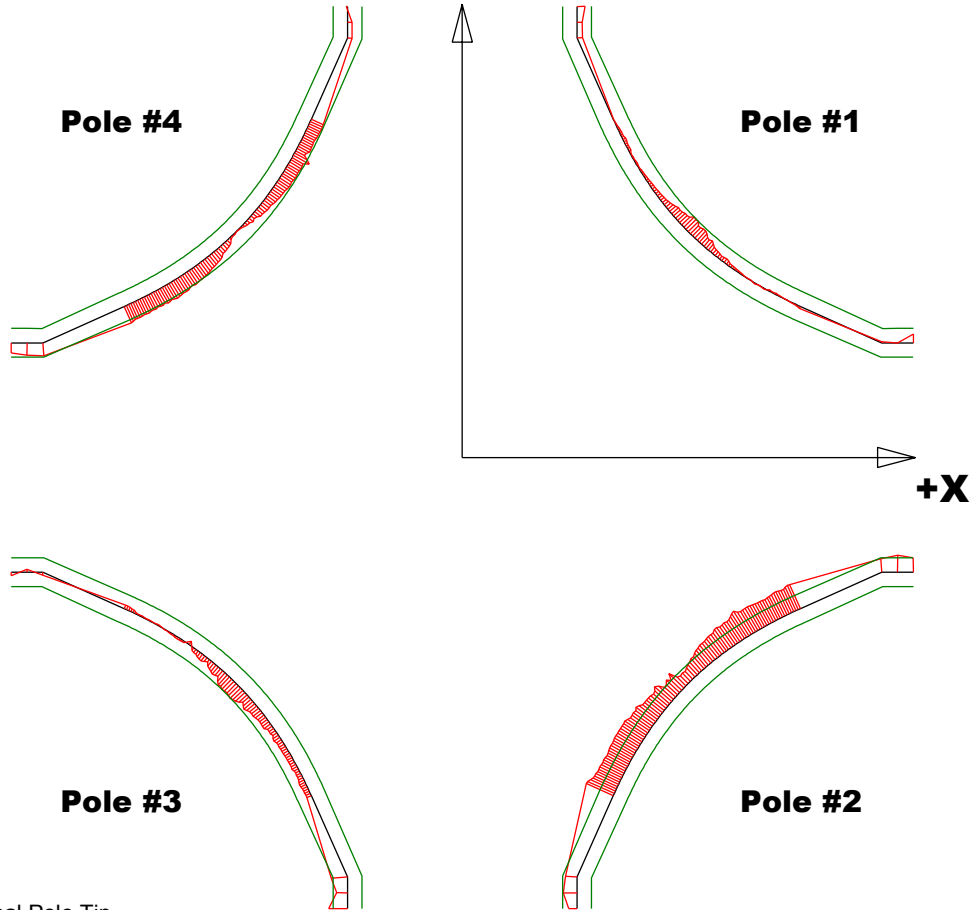
Dimensions in Inch

Barcode # : 4102

Mfg. S/N : 05

Composite Best-fit of Pole Tips, Downstream

+Y



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

Dimensions in Inch

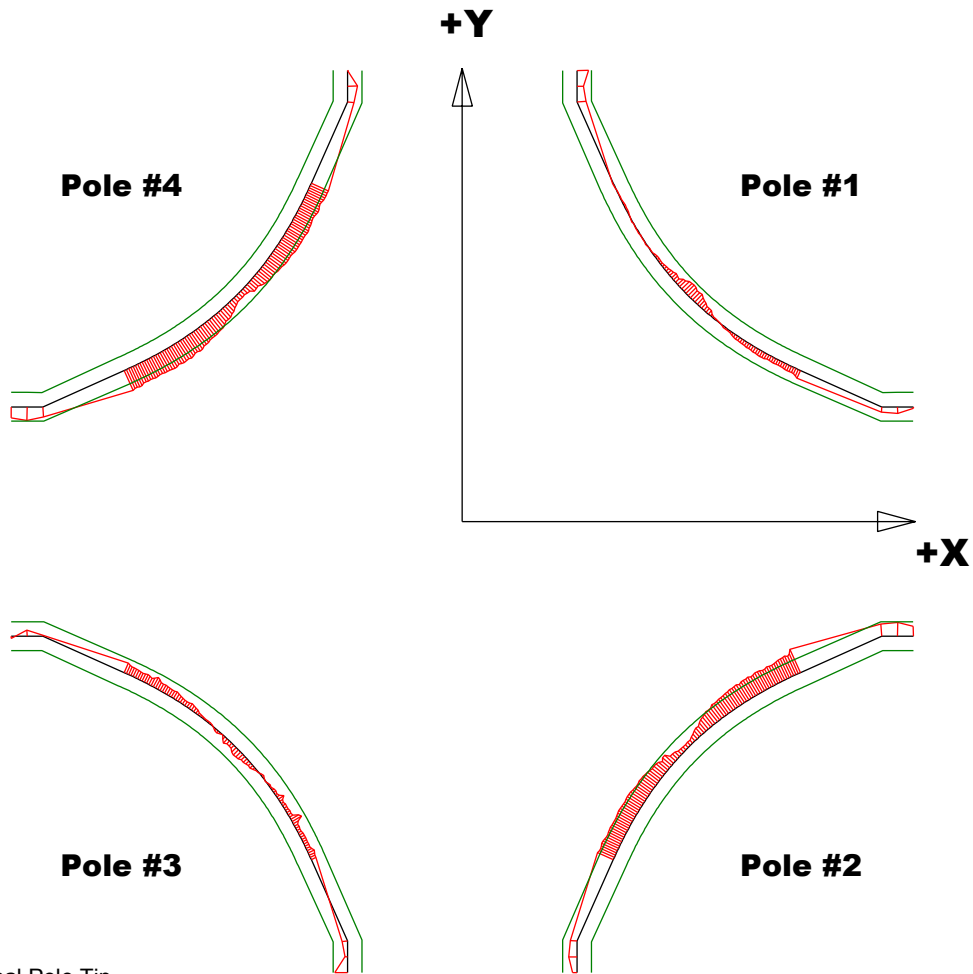
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00014	-0.00206	-0.00028	-0.00127
Max. Dev.	0.00101	-0.00058	0.00132	0.0001

Barcode # : 4102

Mfg. S/N : 05

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

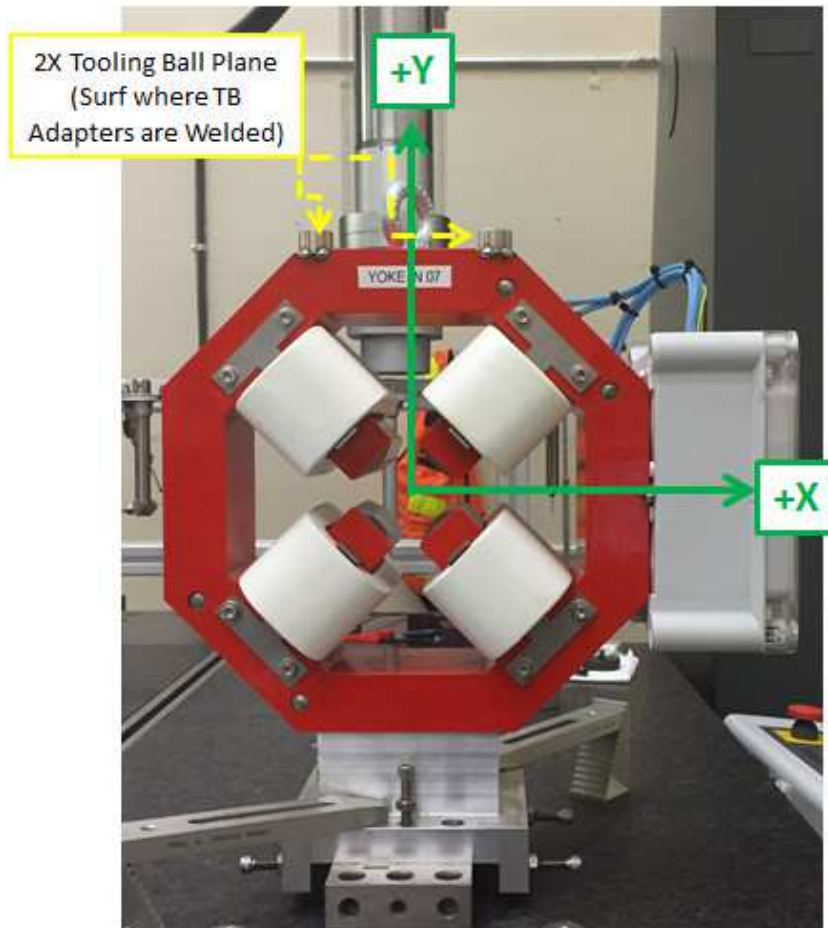
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00058	-0.00179	-0.00076	-0.00151
Max. Dev.	0.00081	-0.00028	0.0009	0.00002

Barcode # : 4102

Mfg. S/N : 05

Angle of the Composite Pole Tip Best-Fit In Relation to Tooling Ball Plane



Angle in Decimal Degrees ° :0.02584

Angle in Milliradians :0.45104

Barcode # : 4102

Mfg. S/N : 05