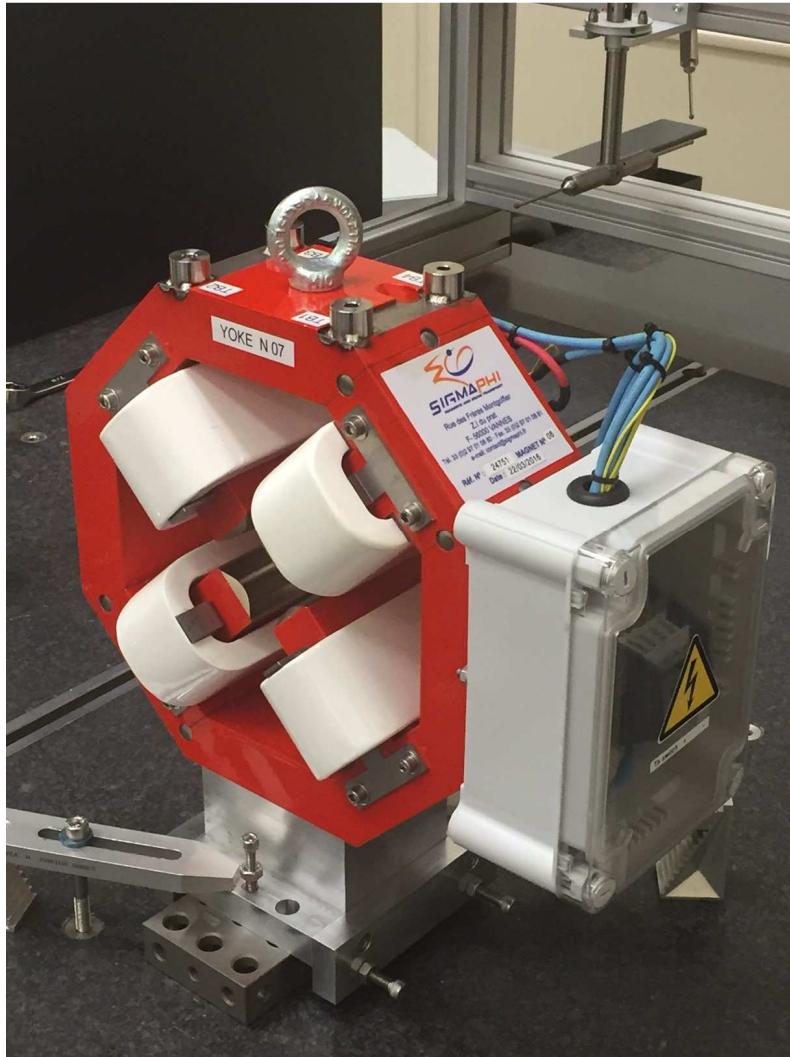


LCLS II Tweaker Quadrupole Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-702-28
Barcode # : 4101
Mfg. S/N : 08

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 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.

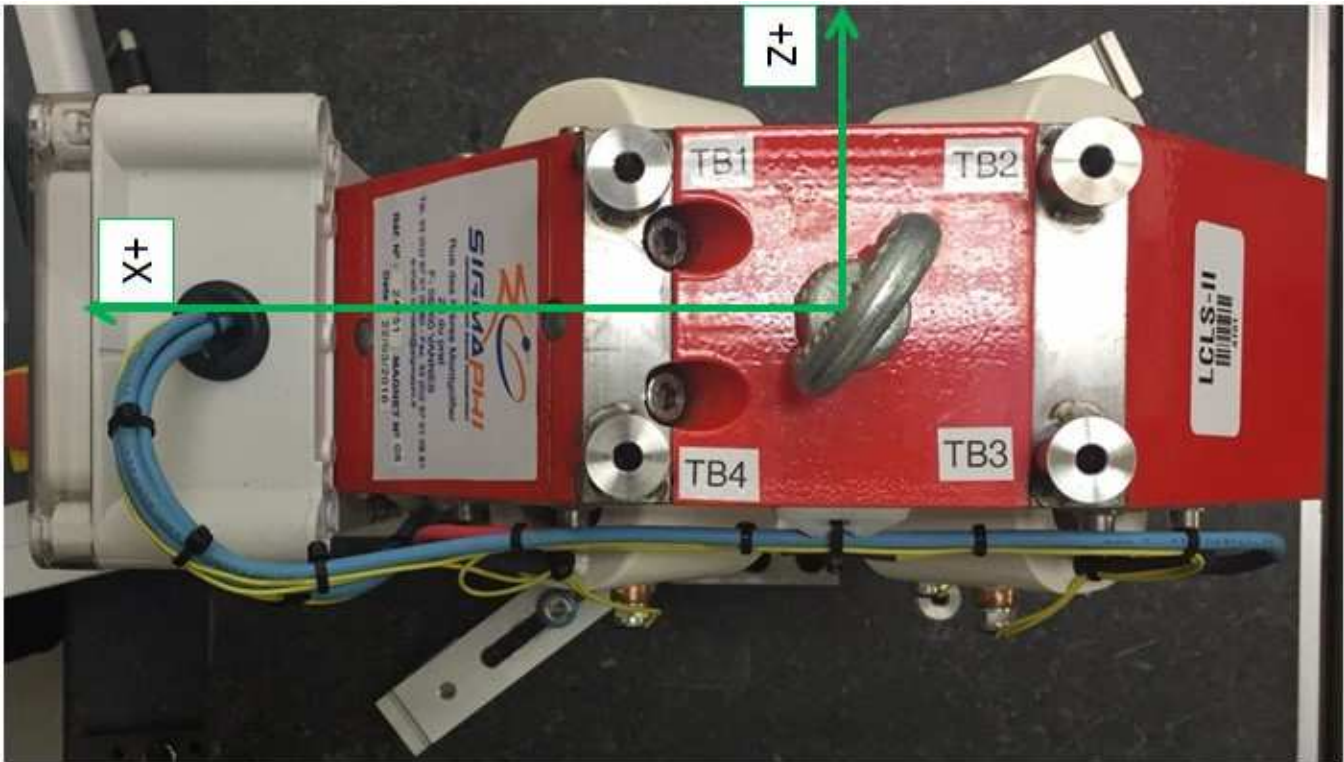
Coordinate Origins

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



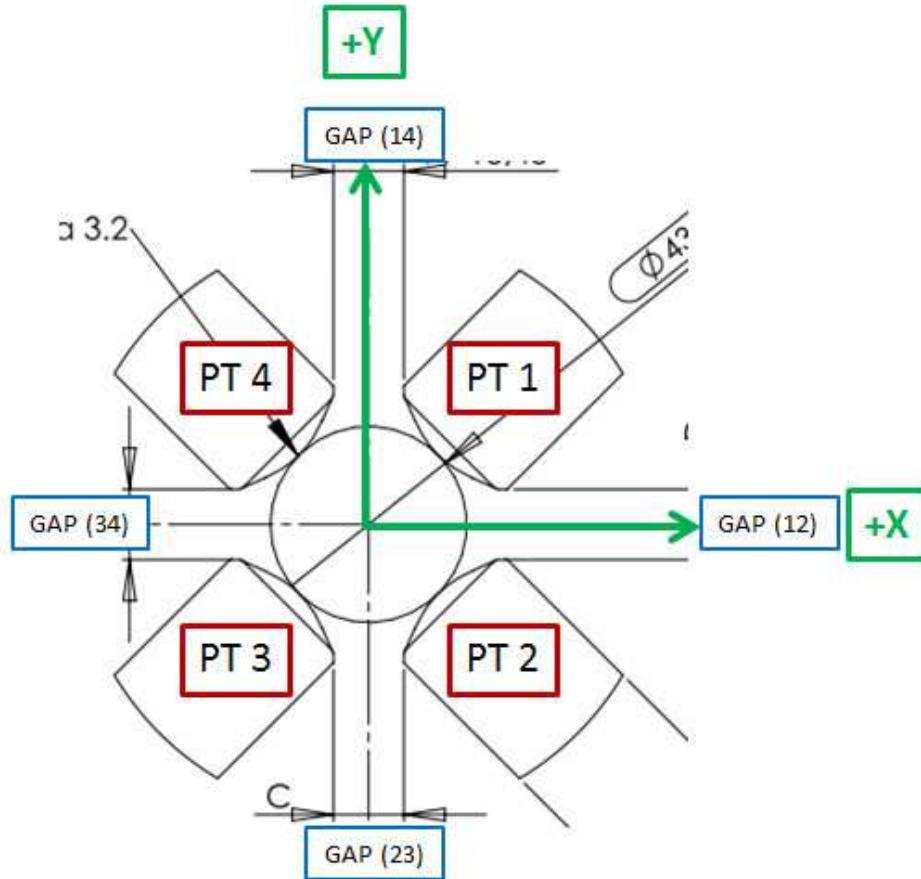
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	1.97265	6.73787	1.25384
TB 2	-1.97103	6.73963	1.26009
TB 3	-1.96709	6.73945	-1.25976
TB 4	1.96782	6.73843	-1.26010
TB A	1.97258	6.04920	1.25369
TB B	-1.97066	6.05111	1.25979
TB C	-1.96759	6.04908	-1.25942
TB D	1.96765	6.04958	-1.25963

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	1.69357	1.69328
Pole Tip Distance 2-4	1.693	1.69241	1.69166
Gap 1-2	0.6075	0.6055	0.60537
Gap 2-3	0.6075	0.60685	0.60662
Gap 3-4	0.6075	0.60546	0.60513
Gap 4-1	0.6075	0.60743	0.60728

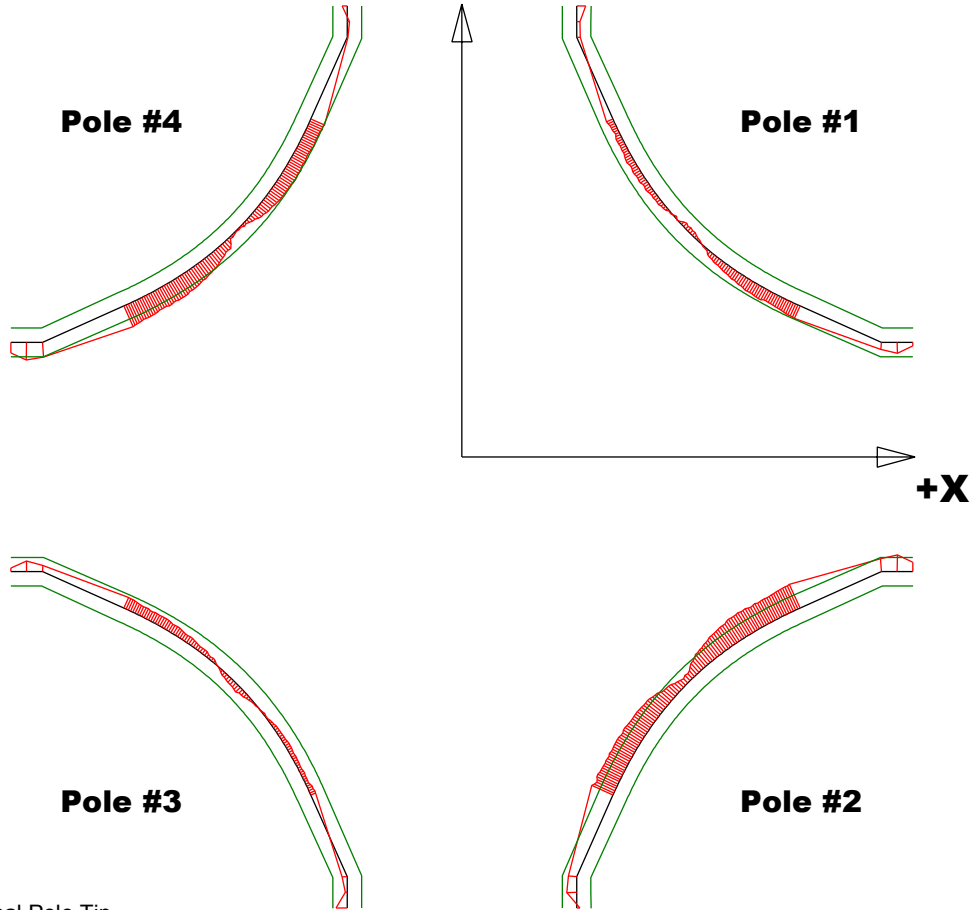
Dimensions in Inch

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Mfg. S/N : 08

Composite Best-fit of Pole Tips, Downstream

+Y



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

Dimensions in Inch

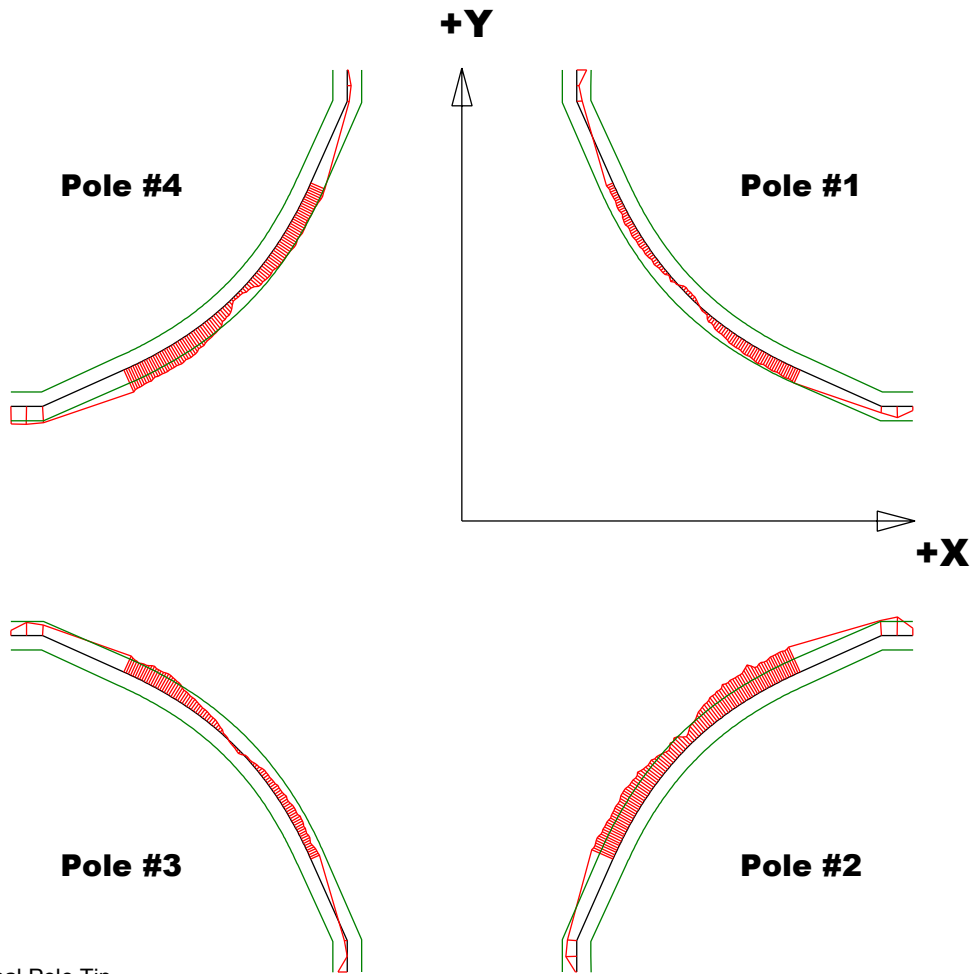
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00095	-0.0018	-0.00081	-0.00157
Max. Dev.	0.00063	0.00024	0.00077	0.00036

Barcode # : 4101

Mfg. S/N : 08

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

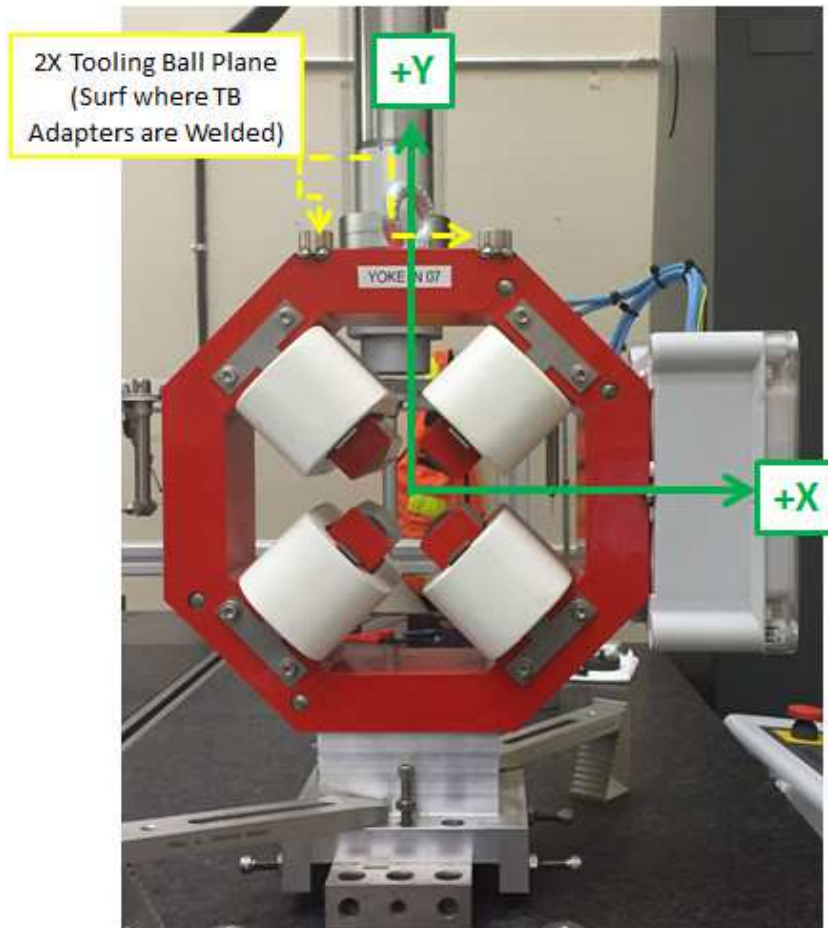
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.001	-0.00209	-0.00129	-0.00168
Max. Dev.	0.0007	-0.00007	0.00064	-0.00007

Barcode # : 4101

Mfg. S/N : 08

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



Angle in Decimal Degrees ° :-0.00012

Angle in Milliradians :-0.00202

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