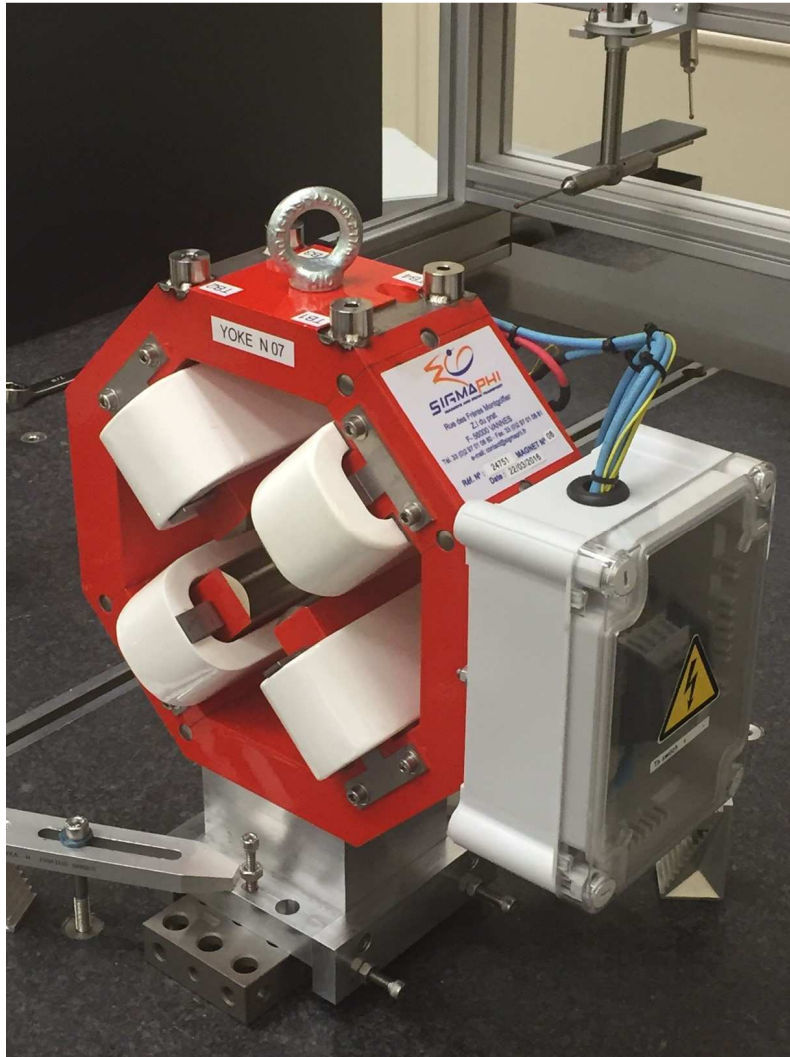


LCLS II Tweaker Quadrupole Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-702-28
Barcode # : 4103
Mfg. S/N : 06

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.

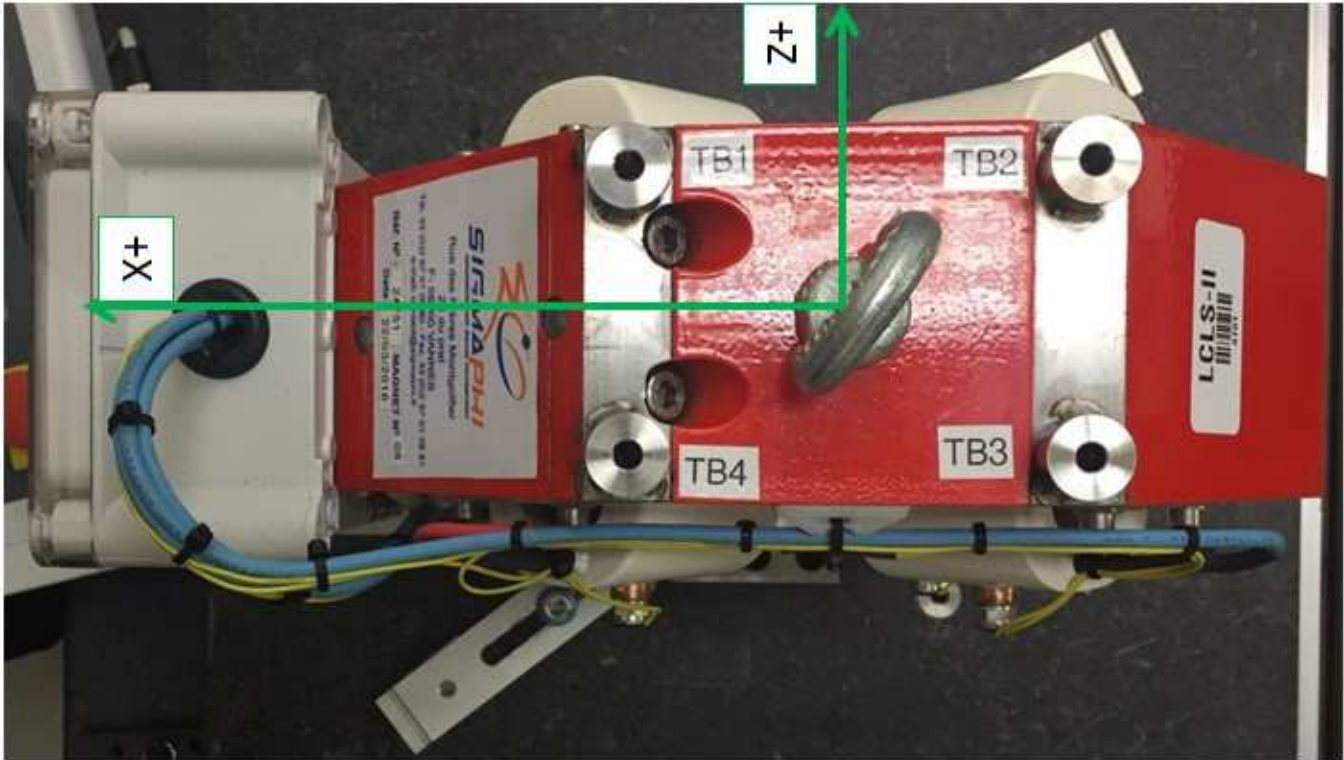
Coordinate Origins

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



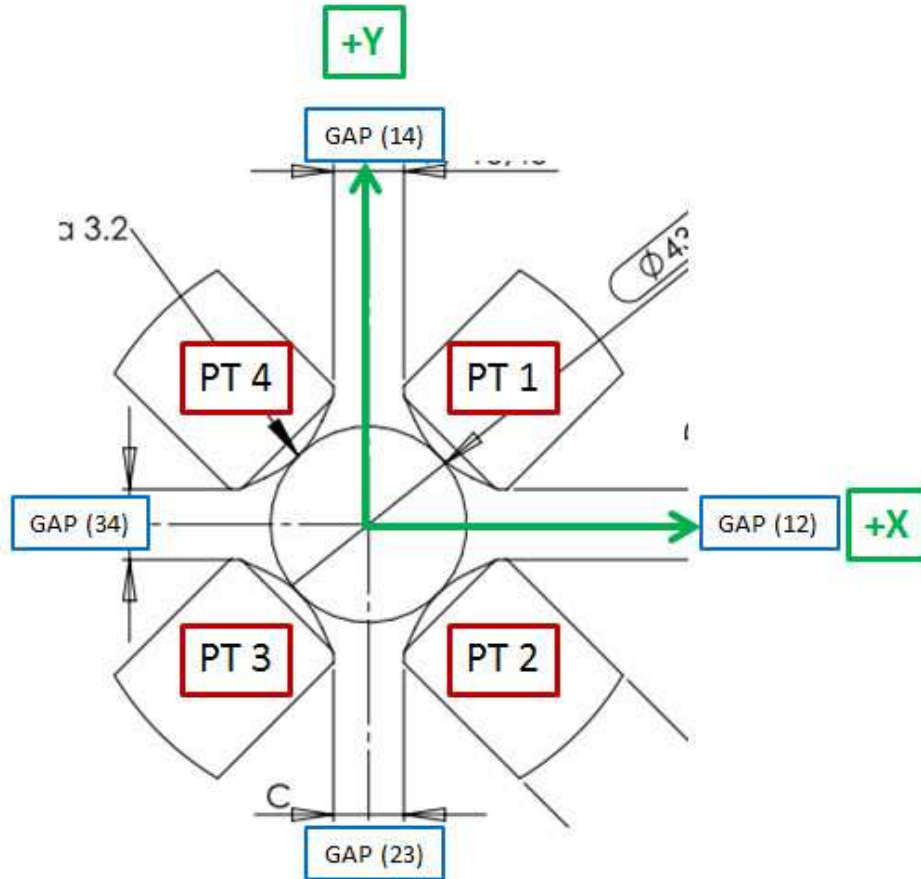
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	1.96665	6.73840	1.26455
TB 2	-1.96715	6.73685	1.25390
TB 3	-1.97267	6.73735	-1.26322
TB 4	1.97192	6.73919	-1.25837
TB A	1.96600	6.04977	1.26342
TB B	-1.96679	6.04812	1.25335
TB C	-1.97267	6.04848	-1.26255
TB D	1.97124	6.05010	-1.25861

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	1.69451	1.69444
Pole Tip Distance 2-4	1.693	1.69199	1.69181
Gap 1-2	0.6075	0.60646	0.60626
Gap 2-3	0.6075	0.60656	0.60666
Gap 3-4	0.6075	0.60636	0.60632
Gap 4-1	0.6075	0.60706	0.60688

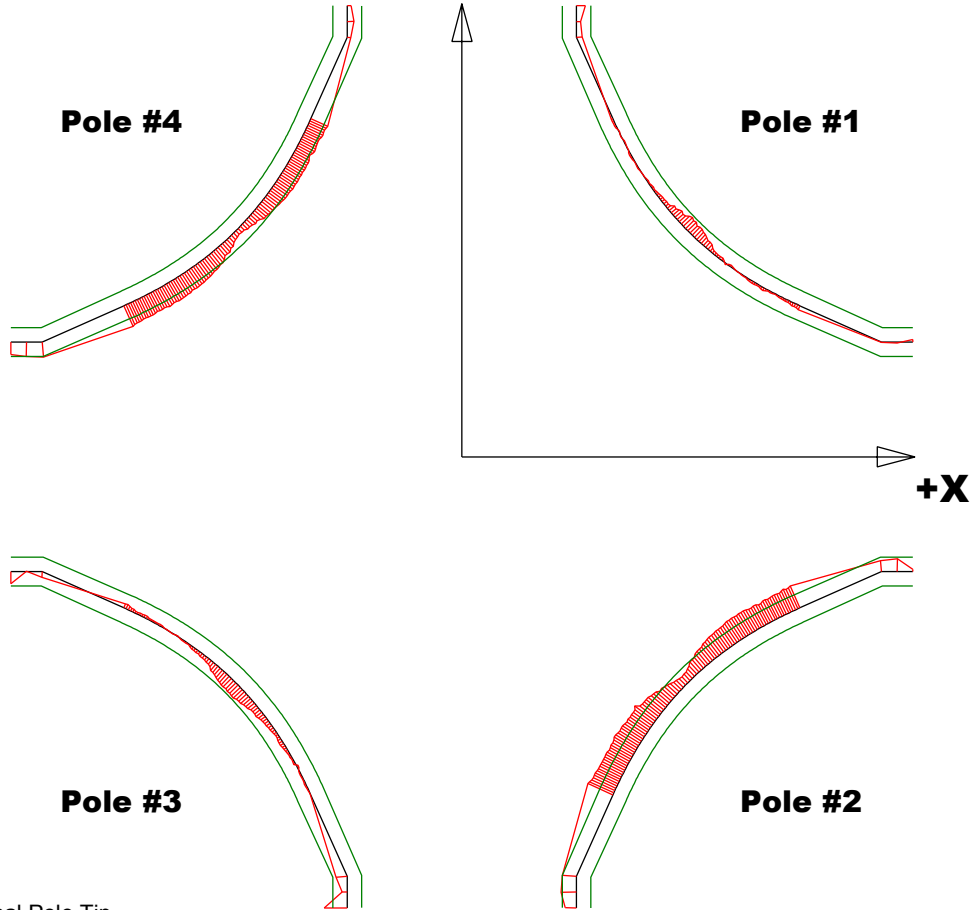
Dimensions in Inch

Barcode # : 4103

Mfg. S/N : 06

Composite Best-fit of Pole Tips, Downstream

+Y



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

Dimensions in Inch

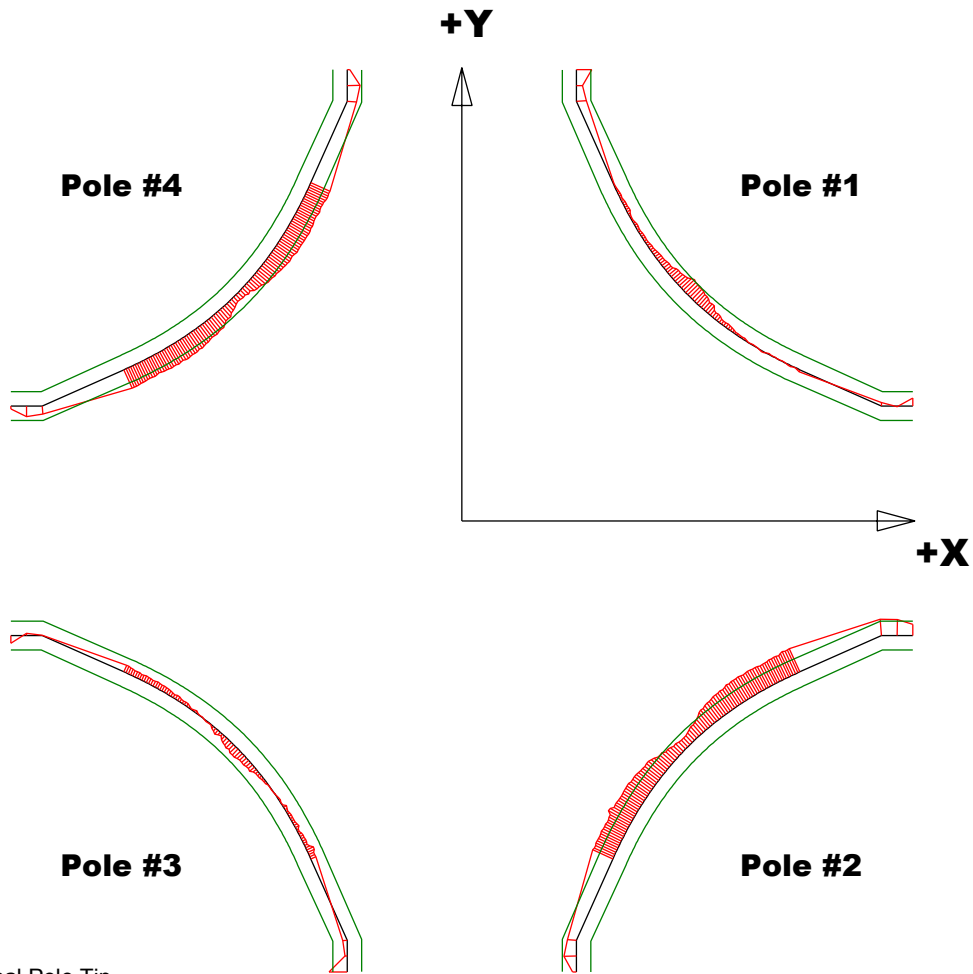
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0003	-0.00191	-0.00033	-0.00156
Max. Dev.	0.00089	-0.00016	0.0016	-0.00025

Barcode # : 4103

Mfg. S/N : 06

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

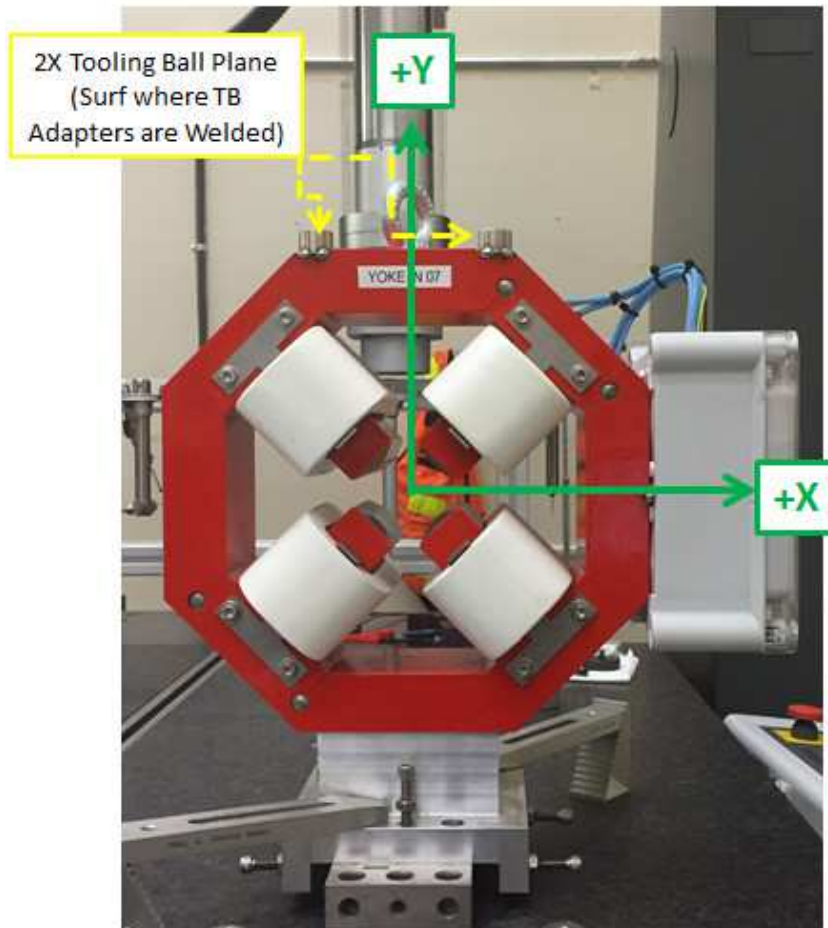
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00015	-0.0018	-0.0005	-0.00149
Max. Dev.	0.00106	-0.00027	0.00126	-0.00017

Barcode # : 4103

Mfg. S/N : 06

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



Angle in Decimal Degrees ° :-0.01110

Angle in Milliradians :-0.19378

Barcode # : 4103

Mfg. S/N : 06