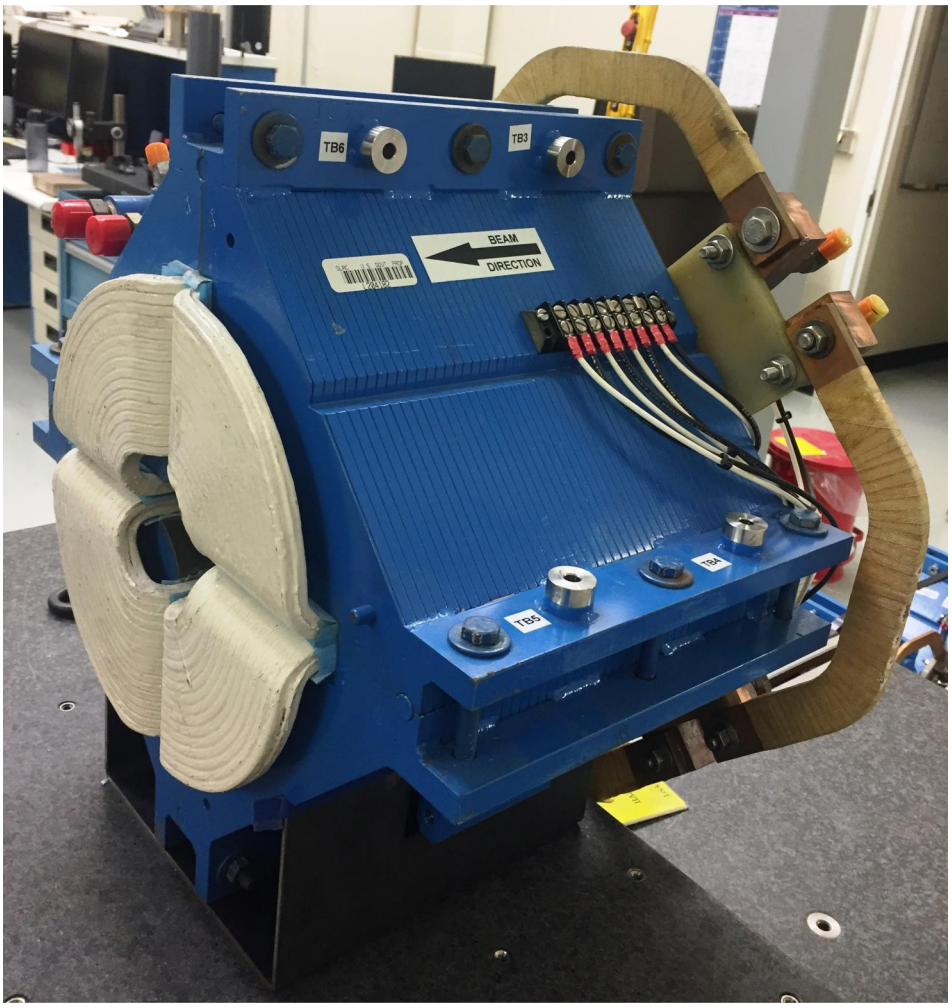
LCLS II 2Q10 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-113-21
Barcode # : 4190
Mfg. S/N : #09

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 0.150 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.

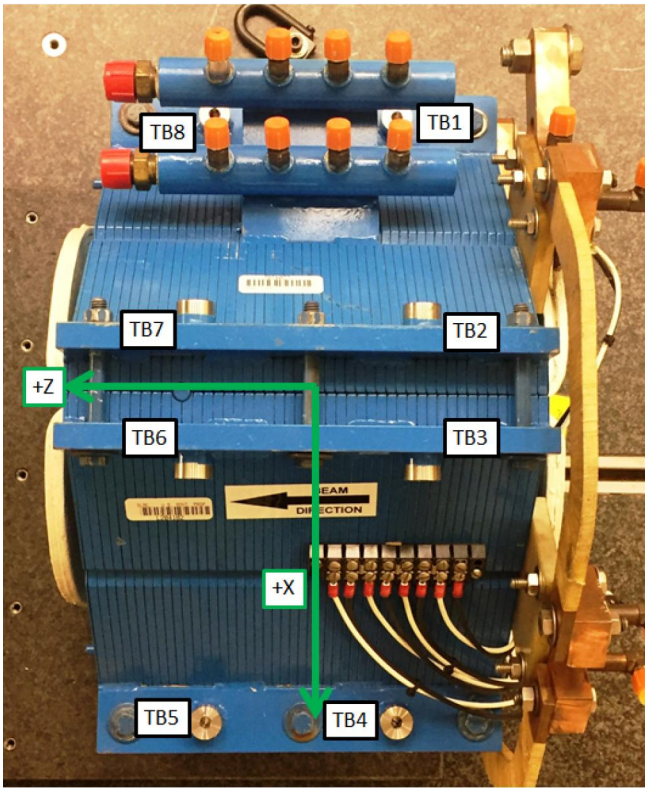
Coordinate Origins

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 # : 4190

Mfg. S/N : #09

Tooling Ball Locations



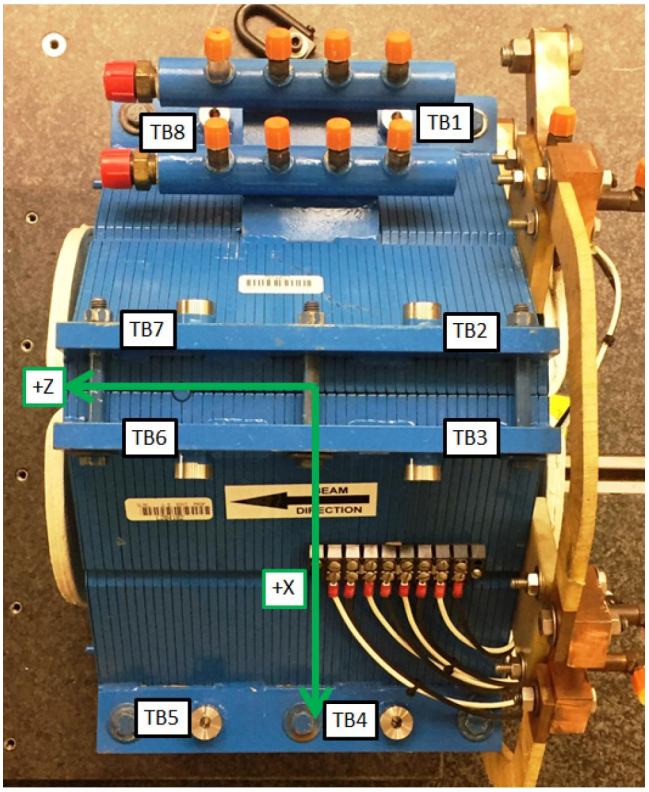
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0741	2.6827	-2.1510
TB 2	-2.6831	7.1059	-2.1741
TB 3	2.6688	7.0713	-2.1791
TB 4	7.0636	2.6773	-2.1967
TB 5	7.0644	2.6817	2.1642
TB 6	2.6845	7.0547	2.1566
TB 7	-2.6720	7.0477	2.1723
TB 8	-7.0572	2.6780	2.1839

Tooling Ball Locations are 1 inch above Tooling Ball Adapter Plane
Dimensions in Inch

Barcode # : 4190

Mfg. S/N : #09

Tooling Ball Locations



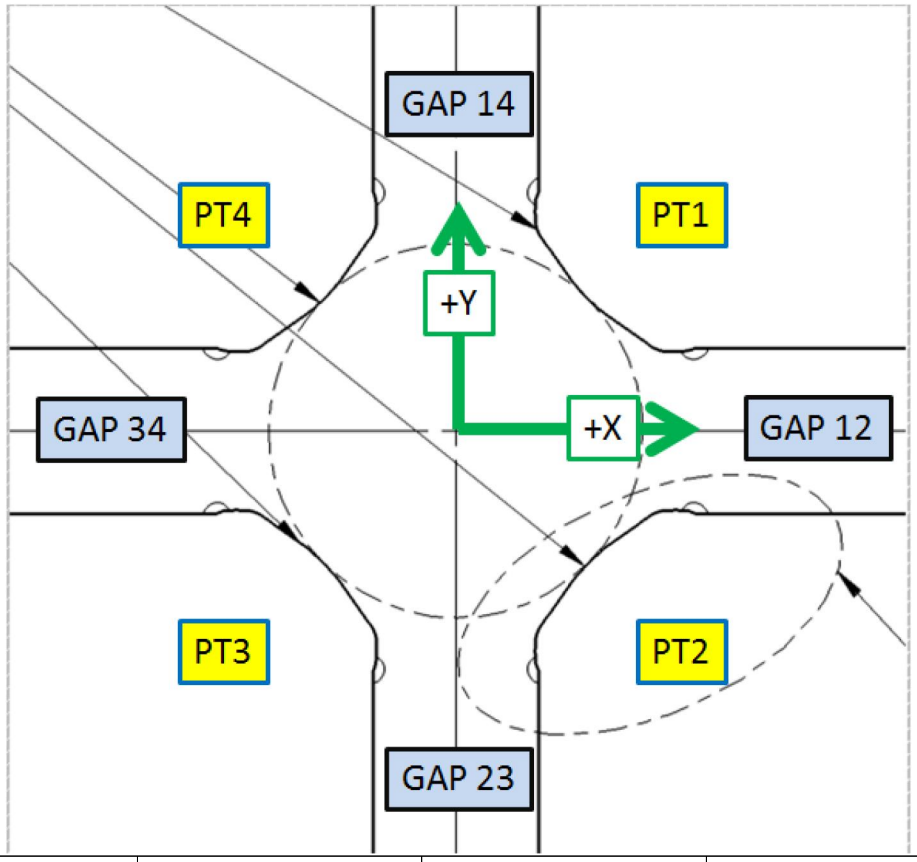
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-7.0708	1.9959	-2.1524
TB 2	-1.9955	7.0848	-2.1804
TB 3	1.9814	7.0686	-2.1798
TB 4	7.0606	1.9901	-2.1948
TB 5	7.0633	1.9942	2.1655
TB 6	1.9959	7.0544	2.1595
TB 7	-1.9842	7.0501	2.1720
TB 8	-7.0554	1.9913	2.1838

Tooling Ball Locations are 5/16 inch above Tooling Ball Adapter Plane
Dimensions in Inch

Barcode # : 4190

Mfg. S/N : #09

Pole Tip Gap Measurements



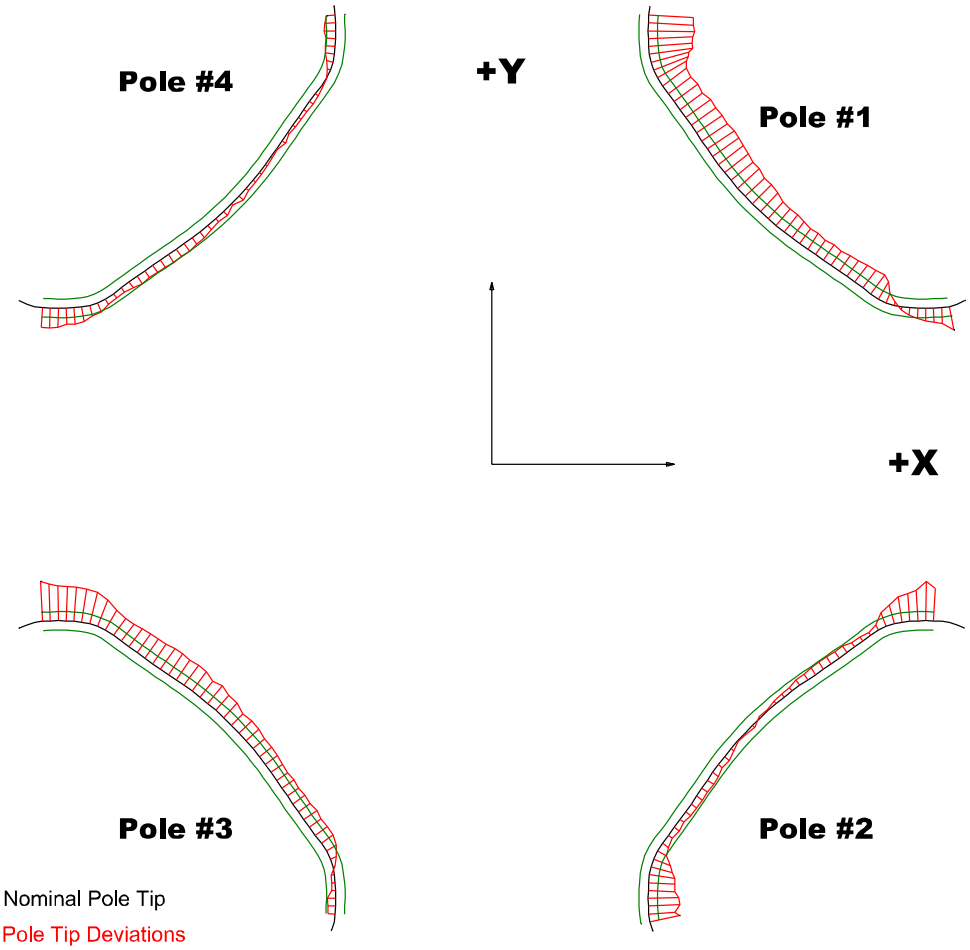
	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.02709	2.02726
PT Distance 2-4	2.026	2.02597	2.02625
Gap 1-2	0.8602	0.84921	0.85066
Gap 2-3	0.8602	0.86153	0.86397
Gap 3-4	0.8602	0.85235	0.85066
Gap 1-4	0.8602	0.86407	0.86631

Dimensions in Inch

Barcode # : 4190

Mfg. S/N : #09

Composite Best-fit of Pole Tips, Downstream



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

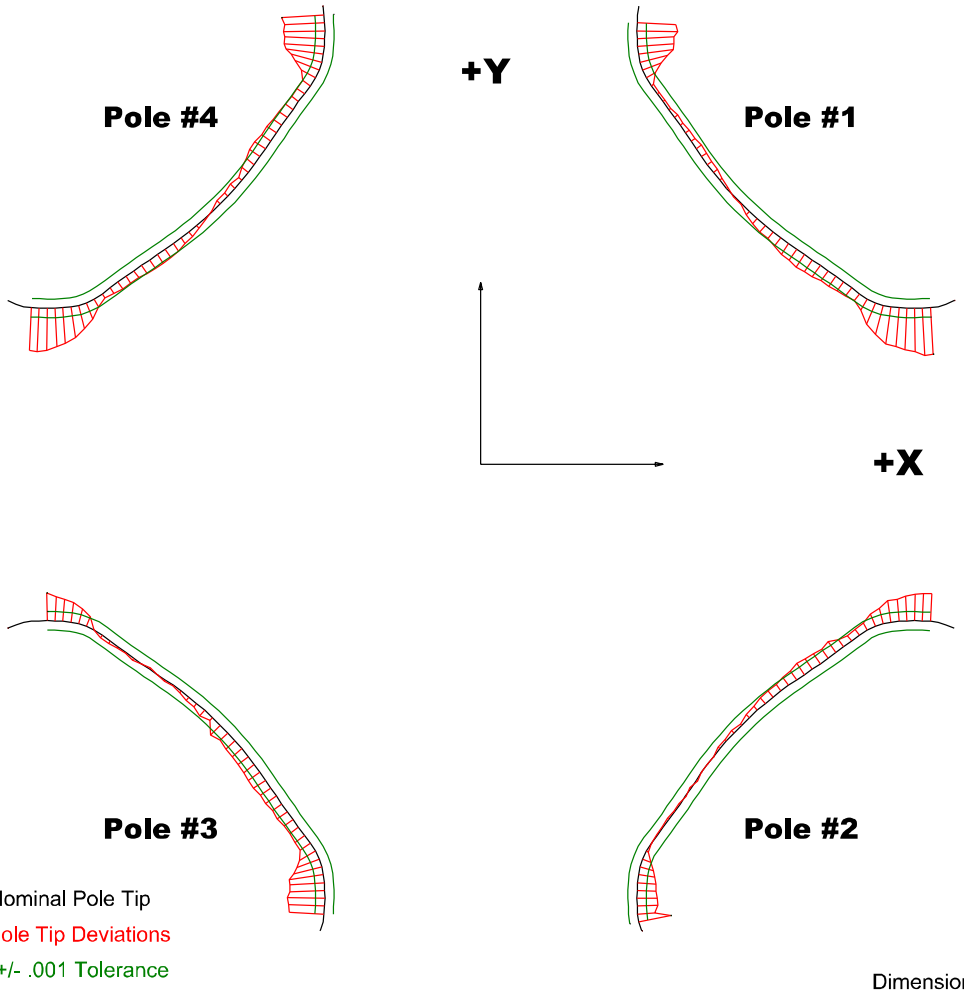
Dimensions in Inch

Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00504	-0.00339	-0.00092	-0.00129
Max. Dev.	0.00252	0.00425	0.00434	0.00213

Barcode # : 4190
Mfg. S/N : #09

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

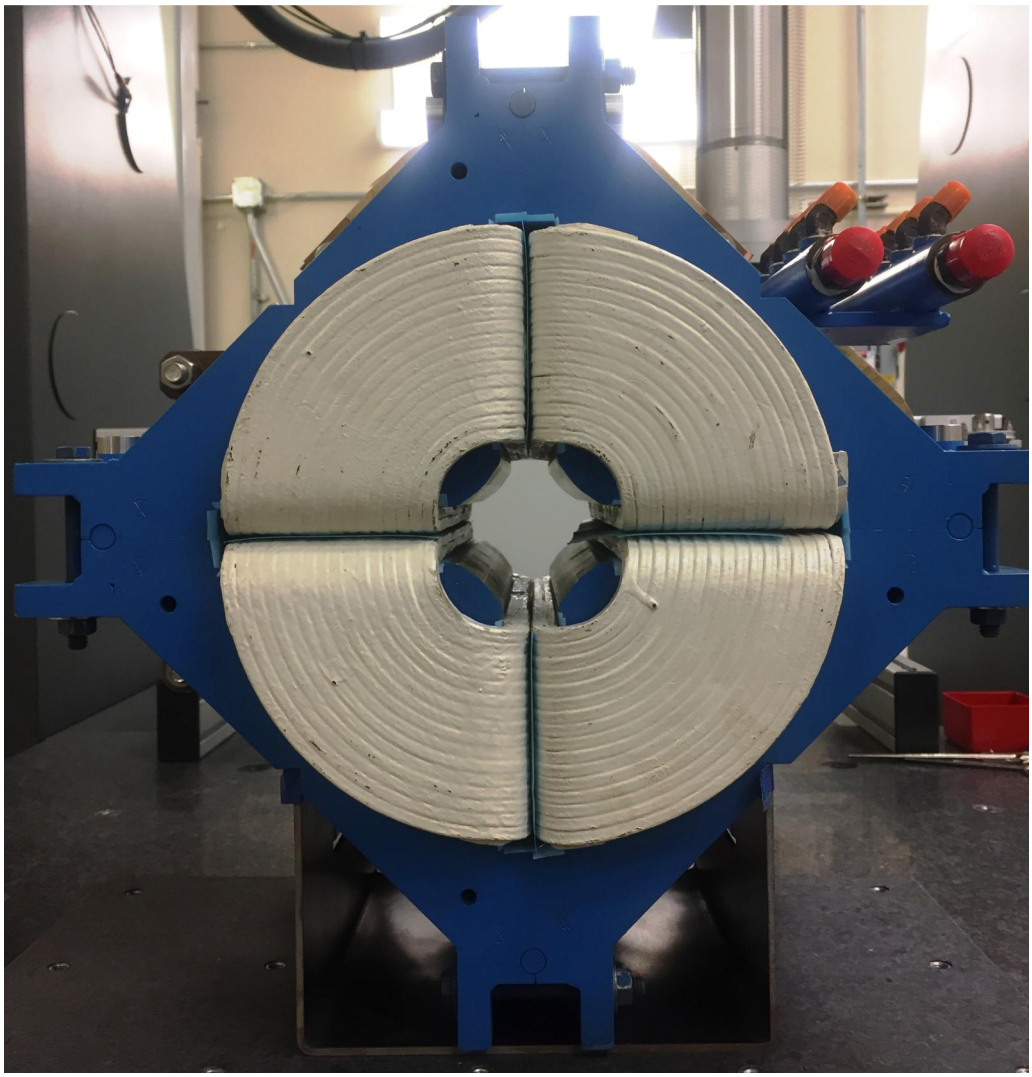
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00438	-0.00353	-0.00407	-0.00463
Max. Dev.	0.00515	0.00301	0.00298	0.00471

Barcode # : 4190

Mfg. S/N : #09

Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° :	0.05996
Angle in Milliradians :	1.04657

Barcode # : 4190

Mfg. S/N : #09