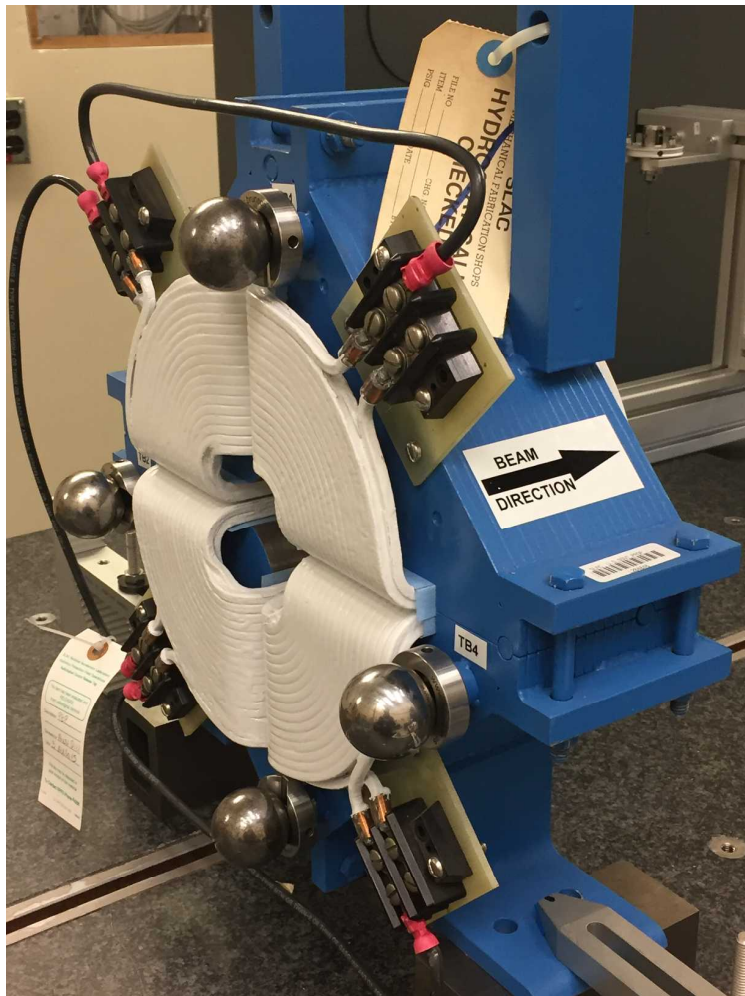


## LCLS II 2Q4 Fiducialization Report



Inspector : K. Caban  
Engineer : J. Amann  
Drawing No. : SA-344-112-01  
Barcode # : 4042  
Old S/N : P38  
Old MAD Element Name : LX05QU7  
Old Unit : QF6730

## 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. The Terminals & Tooling Ball Sockets are UPSTREAM, therefore +Z (DOWNSTREAM) points away from the Terminals & Tooling Ball Sockets.

### 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.

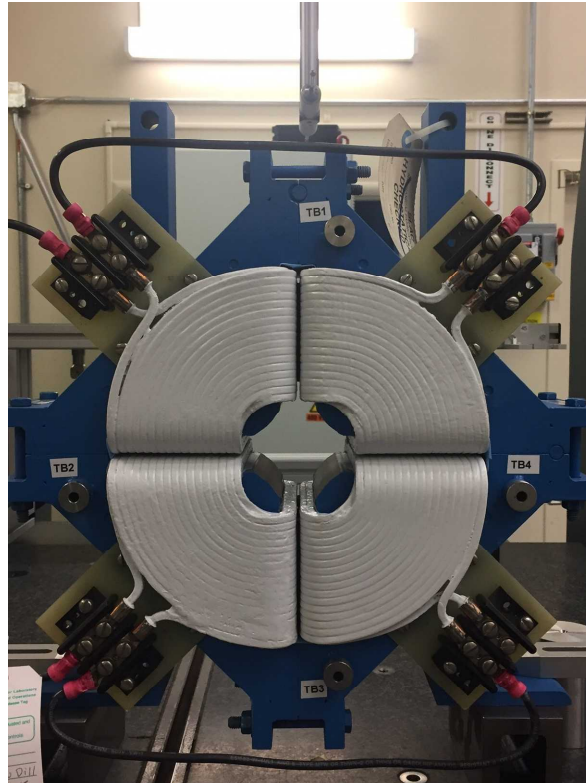
### Coordinate Origins

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 # : 4042**

**Mfg. S/N : P38**

## Tooling Ball Locations



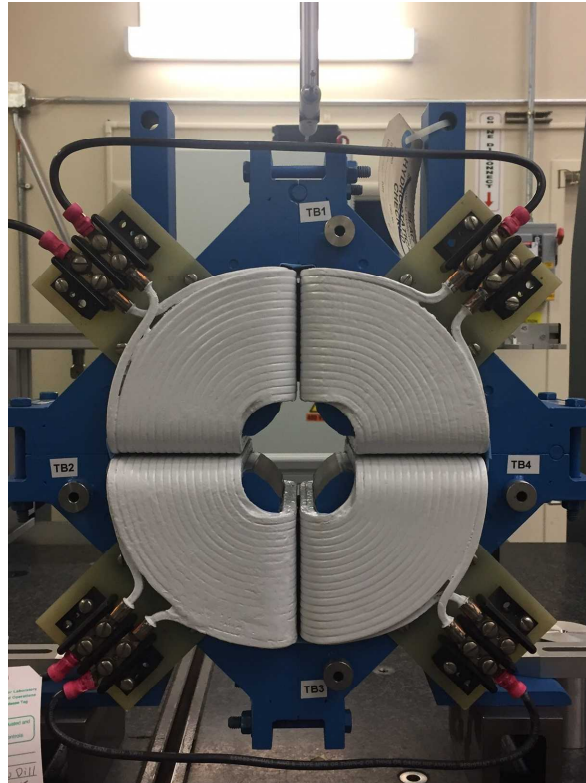
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-1.0015	5.5000	-3.4302
TB 2	5.5034	-1.0072	-3.4289
TB 3	-1.0000	-5.5046	-3.4386
TB 4	-5.5012	-1.0010	-3.4356

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

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## Tooling Ball Locations



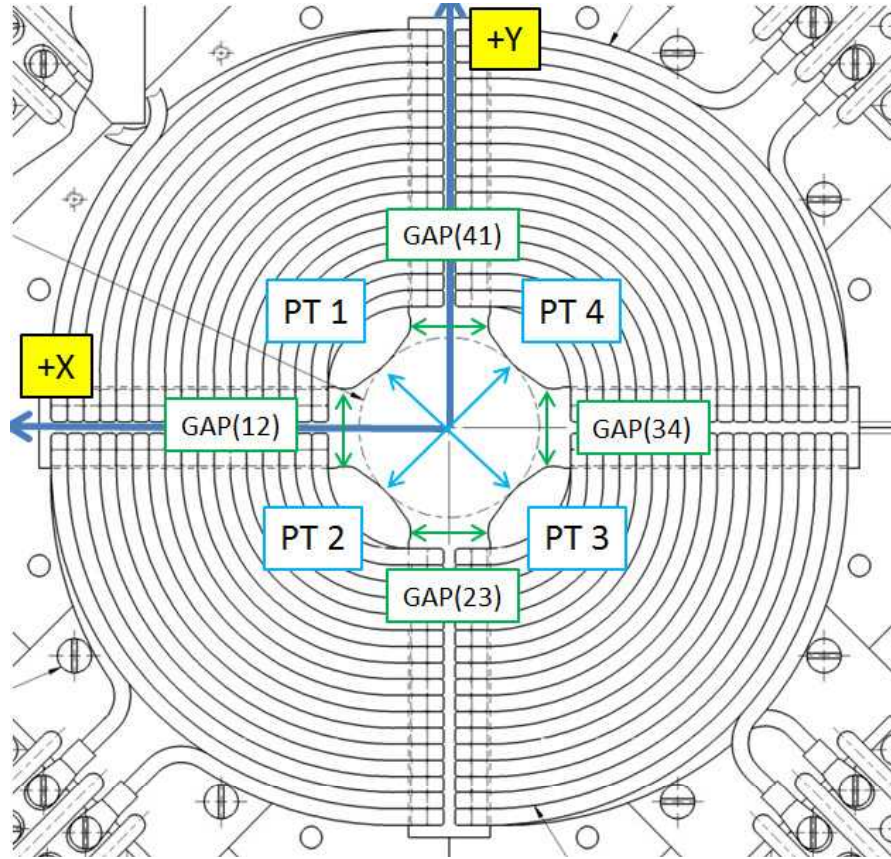
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-1.0022	5.5019	-2.7425
TB 2	5.5014	-1.0025	-2.7408
TB 3	-1.0013	-5.5010	-2.7510
TB 4	-5.5012	-0.9981	-2.7479

Tooling Ball Locations 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	2.086 ± .002	2.08676	2.08785
Pole Tip Distance 2-4	2.086 ± .002	2.08633	2.08816
Gap 1-2	0.900	0.90185	0.90212
Gap 2-3	0.900	0.90137	0.90363
Gap 3-4	0.900	0.89823	0.90296
Gap 4-1	0.900	0.89961	0.90271

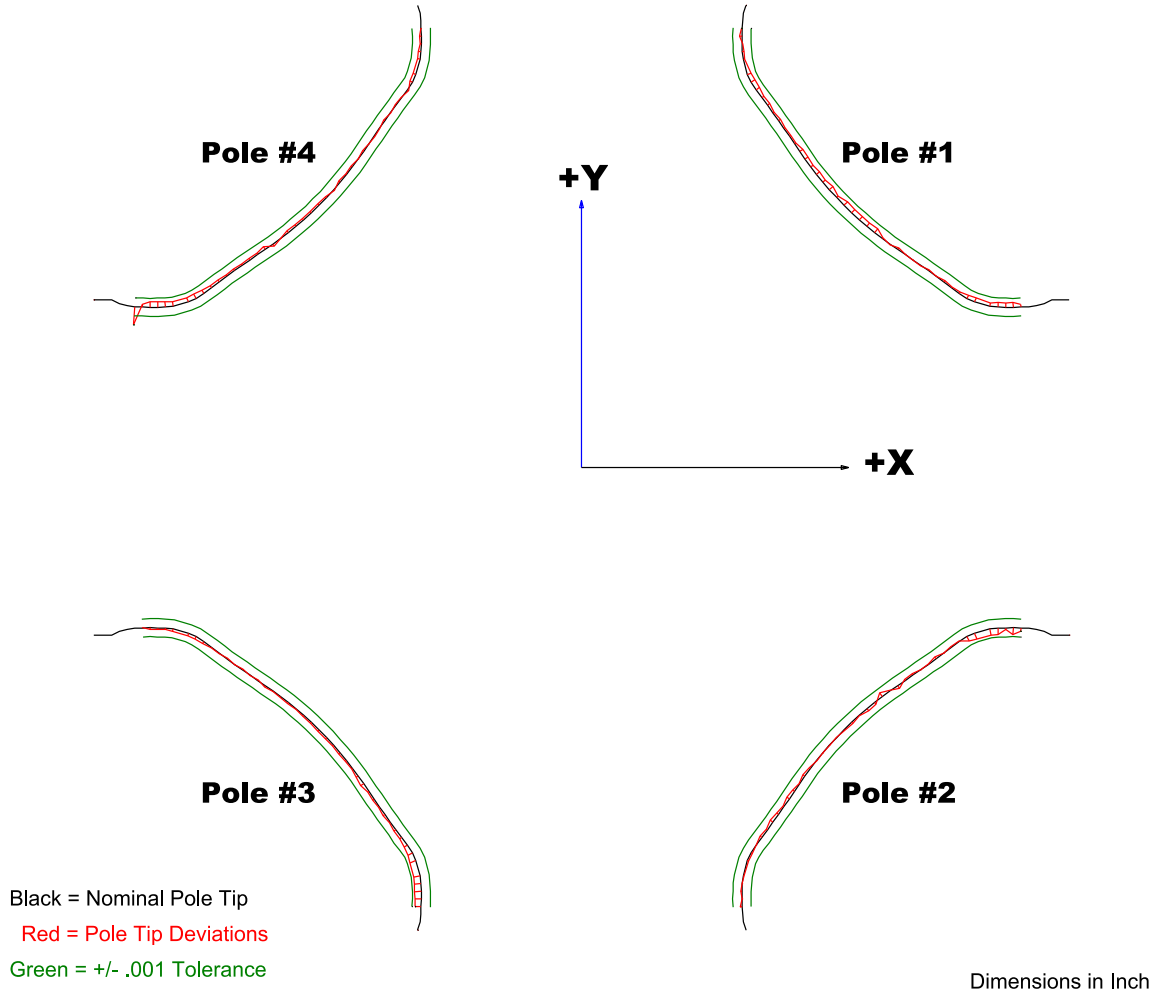
**Barcode # : 4042**

Dimensions in Inch

**Mfg. S/N : P38**



## Composite Best-fit of Pole Tips, Downstream



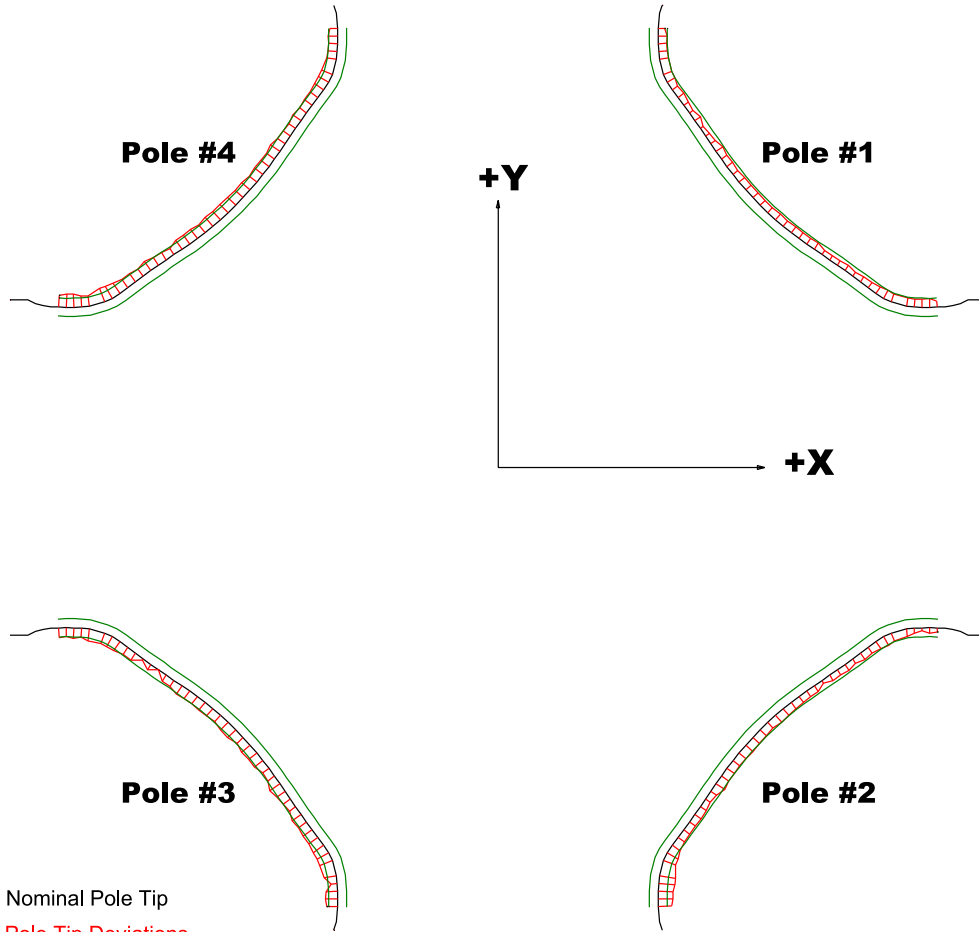
### Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00028	-0.00051	-0.00013	-0.00201
Max. Dev.	0.00057	0.00077	0.00076	0.00063

**Barcode # : 4042**

**Mfg. S/N : P38**

## Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

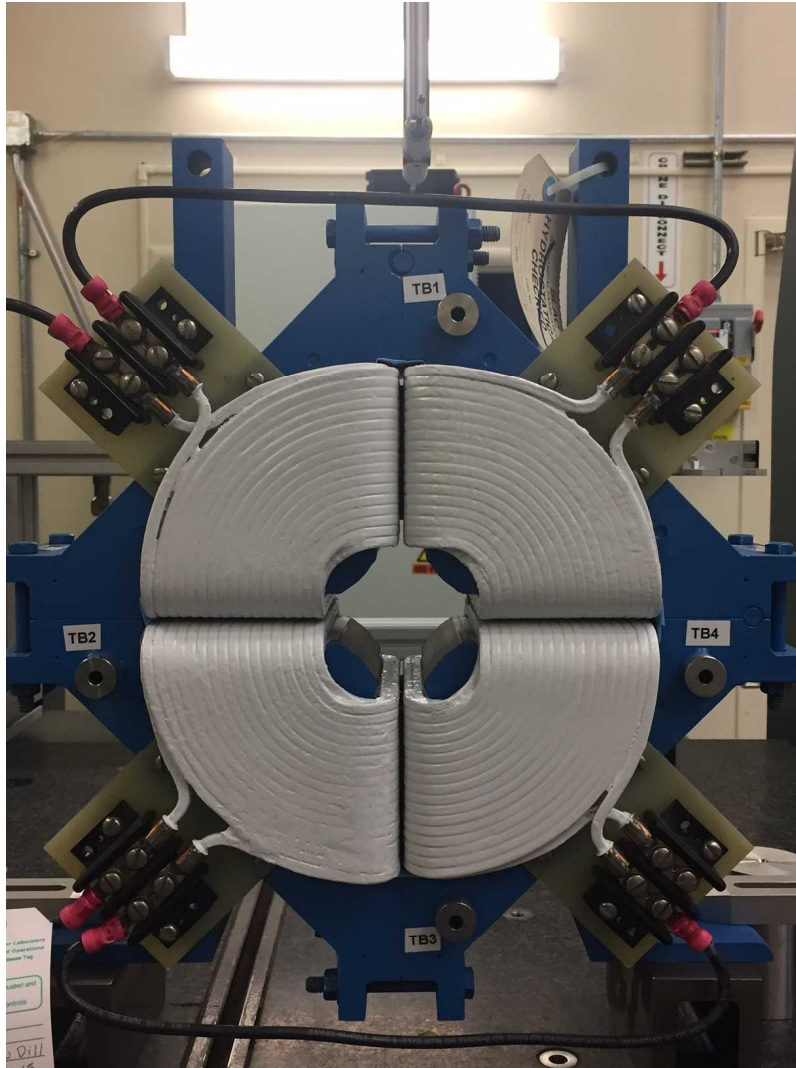
### Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	0.00039	0.00033	0.00001	0.00083
Max. Dev.	0.00107	0.00177	0.00153	0.0016

**Barcode # : 4042**

**Mfg. S/N : P38**

## Angle of the Composite Pole Tip Best-Fit In Relation to Base



Angle in Decimal Degrees ° :0.05338

Angle in Milliradians :0.93162

**Barcode # : 4042**

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