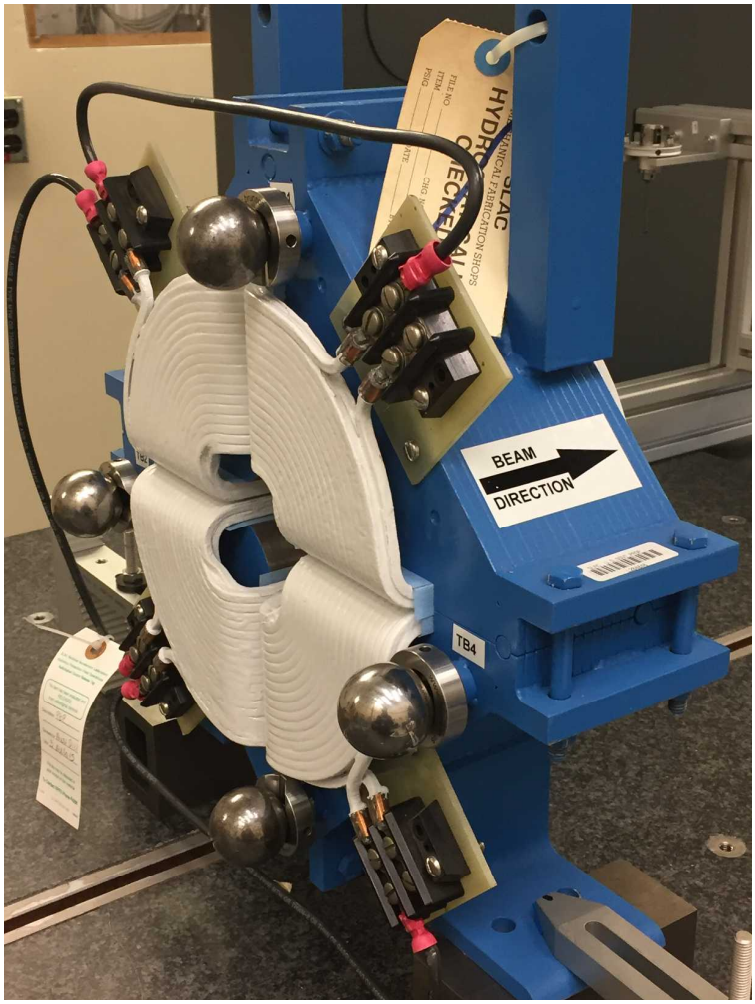
LCLS II 2Q4 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-344-112-01
Barcode # : 4047
Old S/N : P14
Old MAD Element Name : LX05QU6
Old Unit : Q06630

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.

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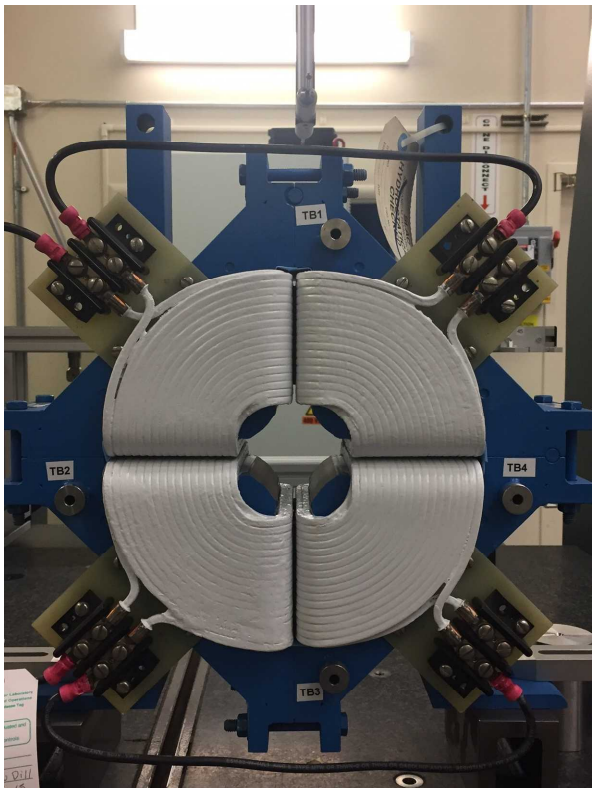
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-1.0004	5.4970	-3.4279
TB 2	5.4998	-1.0035	-3.4348
TB 3	-1.0119	-5.4968	-3.4322
TB 4	-5.5046	-0.9976	-3.4331

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

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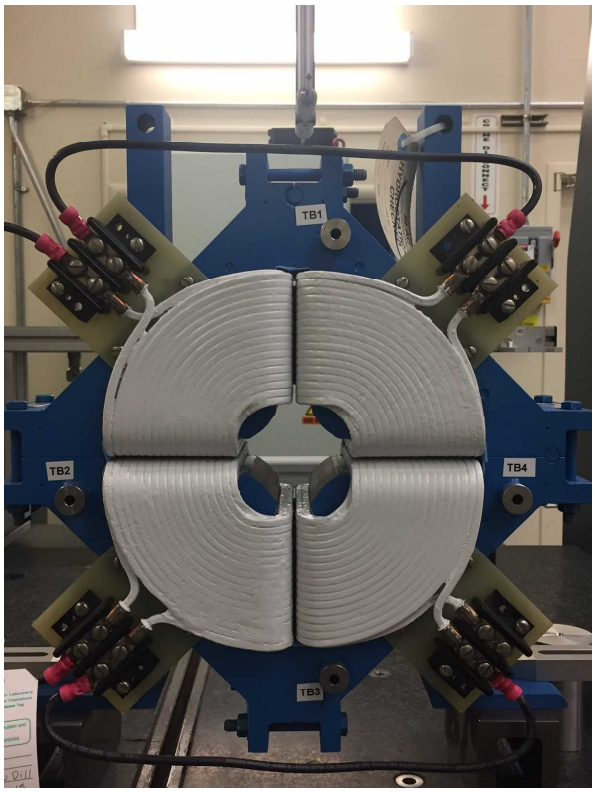
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-1.0007	5.4971	-2.7409
TB 2	5.4991	-1.0015	-2.7480
TB 3	-1.0093	-5.4965	-2.7449
TB 4	-5.5039	-0.9950	-2.7455

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

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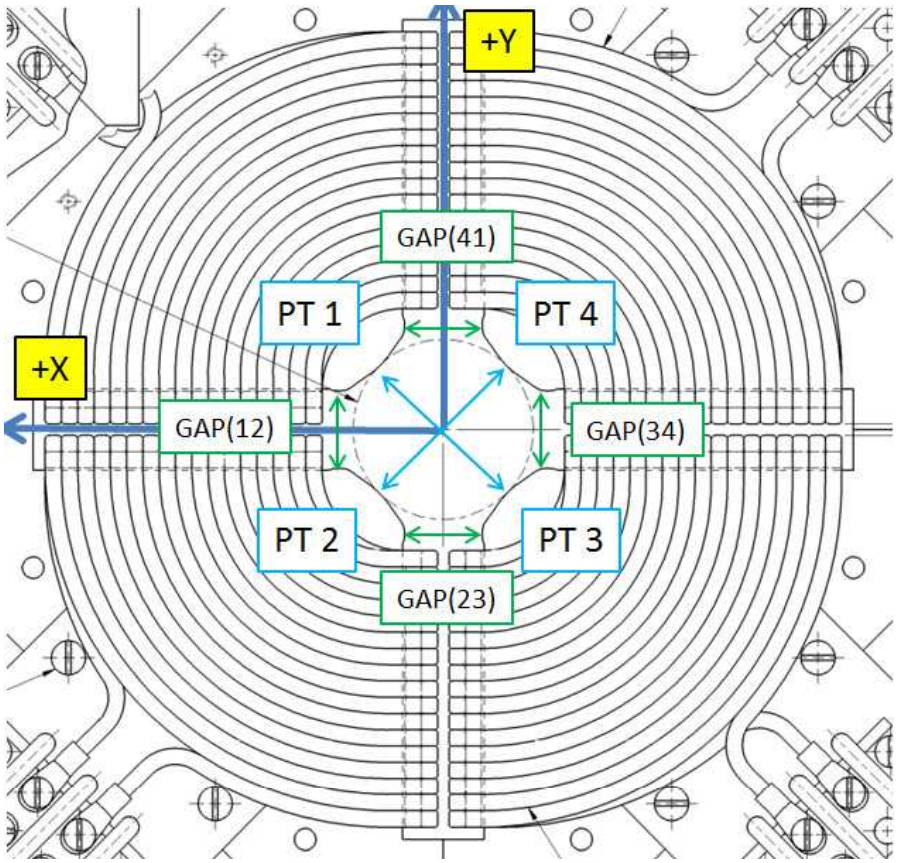
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	2.086 ± .002	2.08501	2.08595
Pole Tip Distance 2-4	2.086 ± .002	2.08051	2.08559
Gap 1-2	0.900	0.90595	0.89653
Gap 2-3	0.900	0.90329	0.9042
Gap 3-4	0.900	0.89967	0.89167
Gap 4-1	0.900	0.89928	0.89828

Dimensions in Inch

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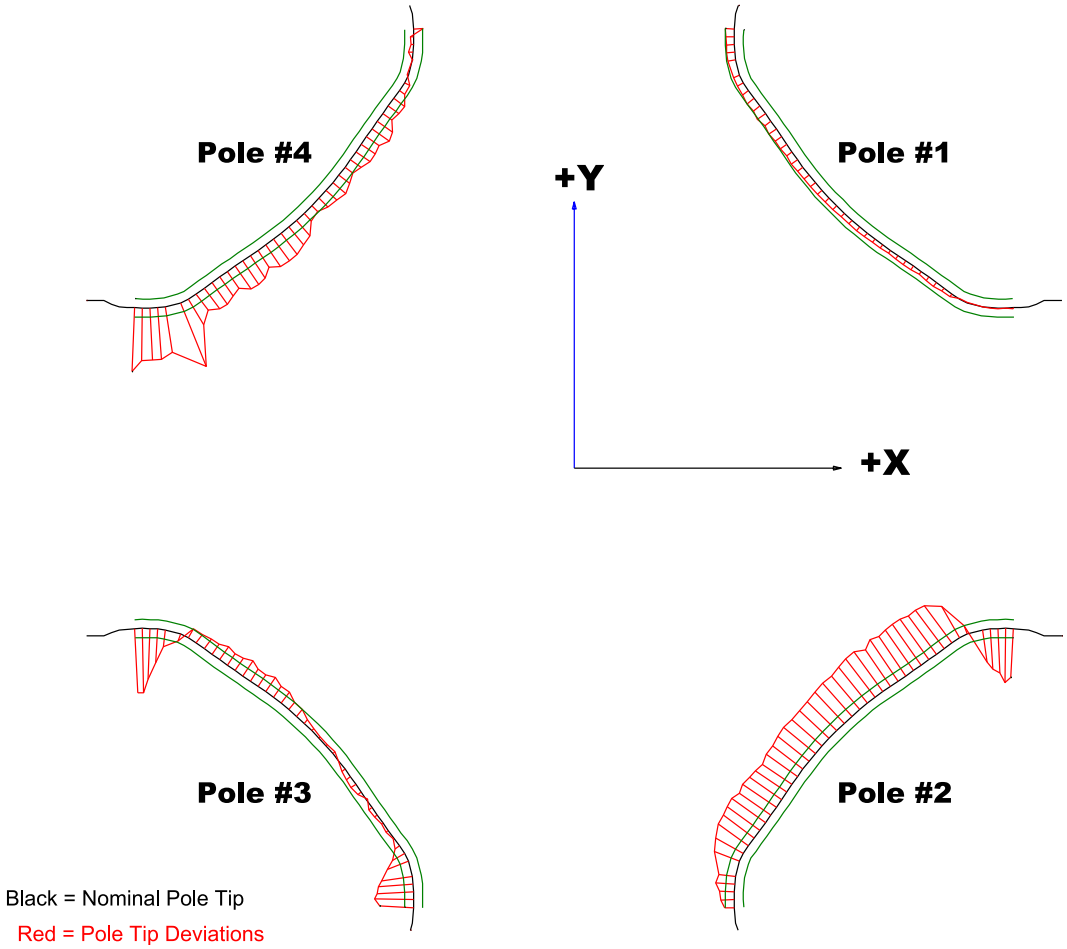
Composite Best-fit of Pole Tips, Downstream



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.	-0.00109	-0.00556	-0.00205	-0.00757
Max. Dev.	0.00008	0.00597	0.00714	0.00053

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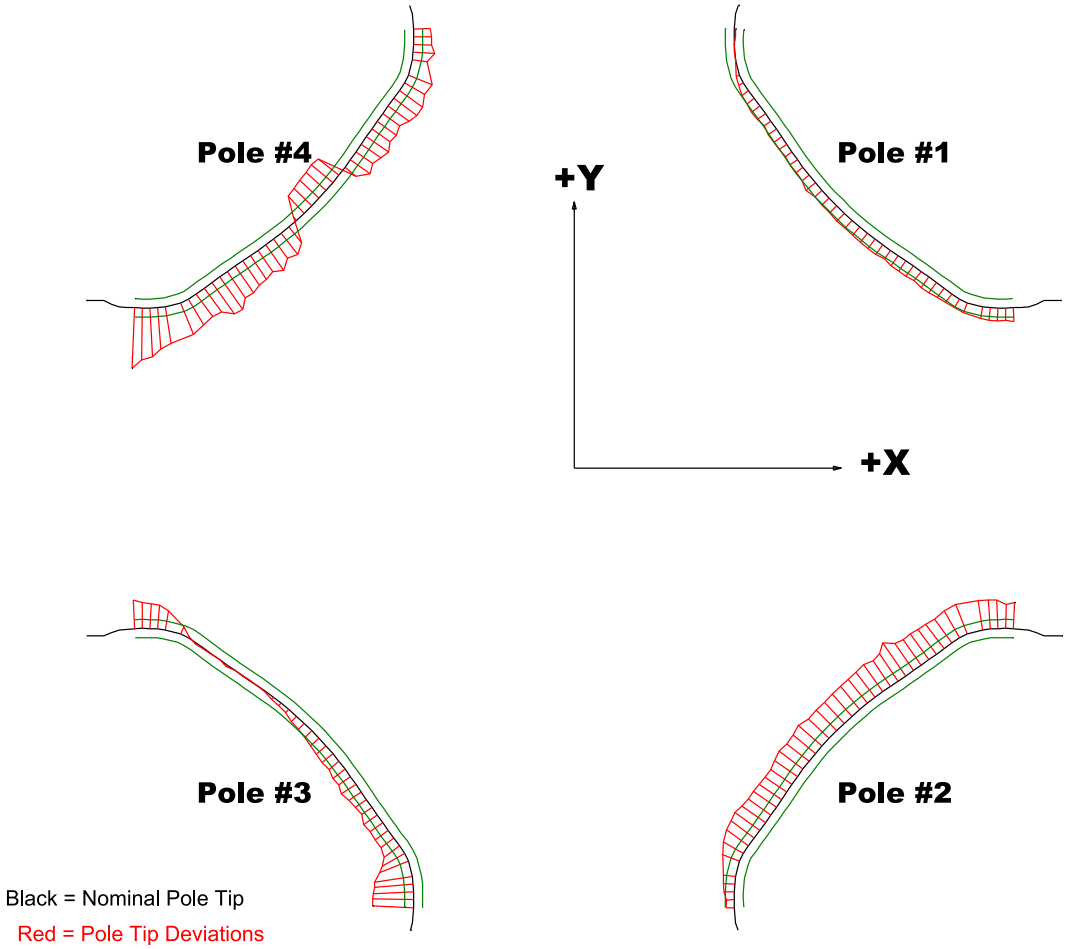
Composite Best-fit of Pole Tips, Upstream



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.	-0.0015	-0.00448	-0.00321	-0.0067
Max. Dev.	0.00014	-0.00085	0.00458	0.00313

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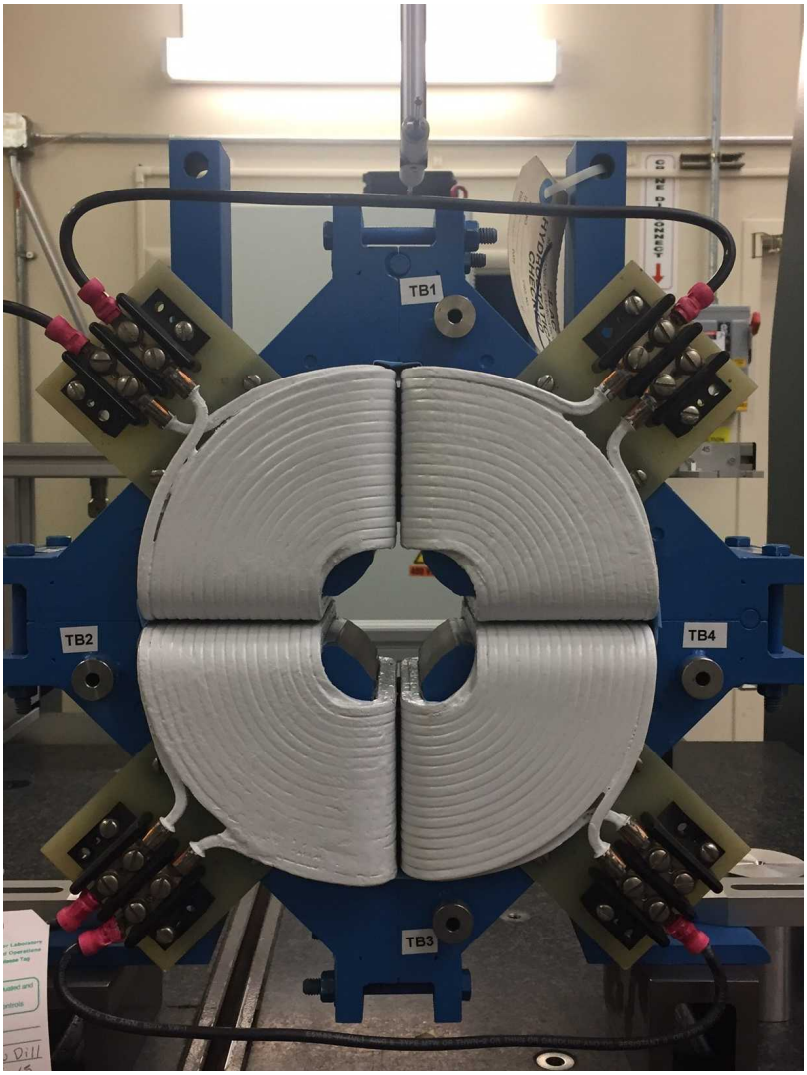
Angle of the Composite Pole Tip Best-Fit In Relation to Base



Angle in Decimal Degrees ° :0.06745

Angle in Milliradians :1.17719

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