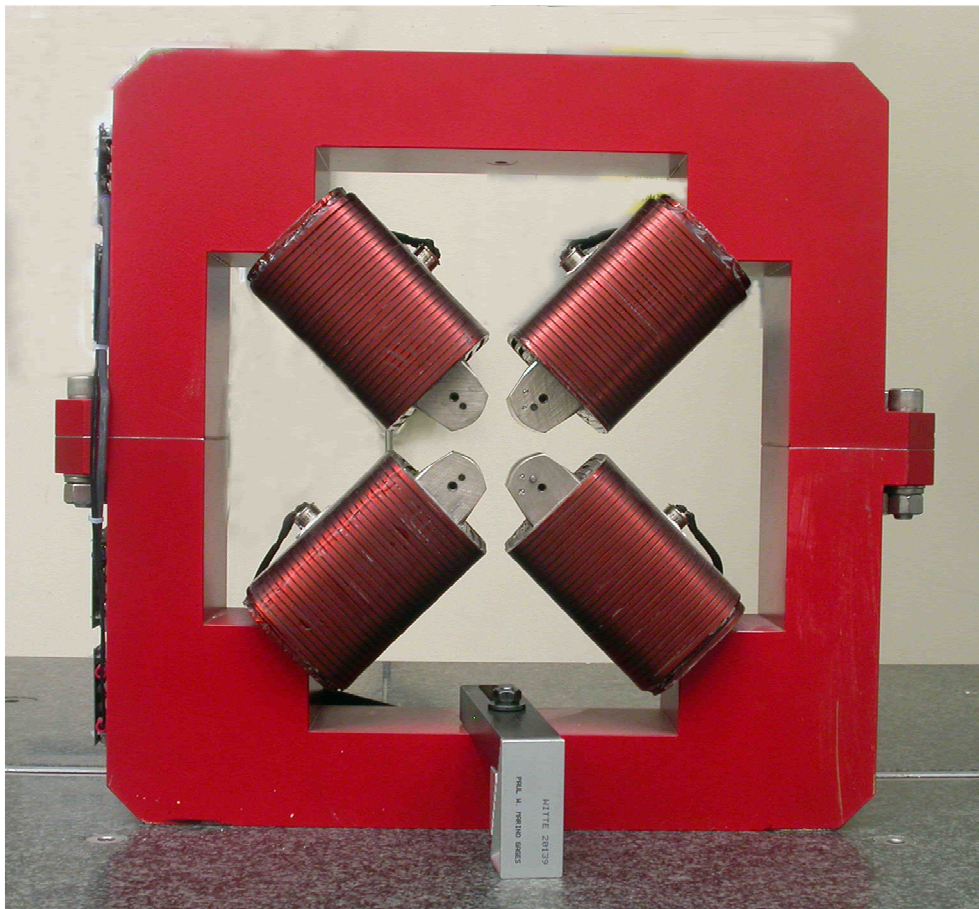


## **LCLS II Injector Quadrupole Fiducialization Report**



**Barcode # : ' 002741**  
**Beamline Name: QM01B**

## **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 .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**

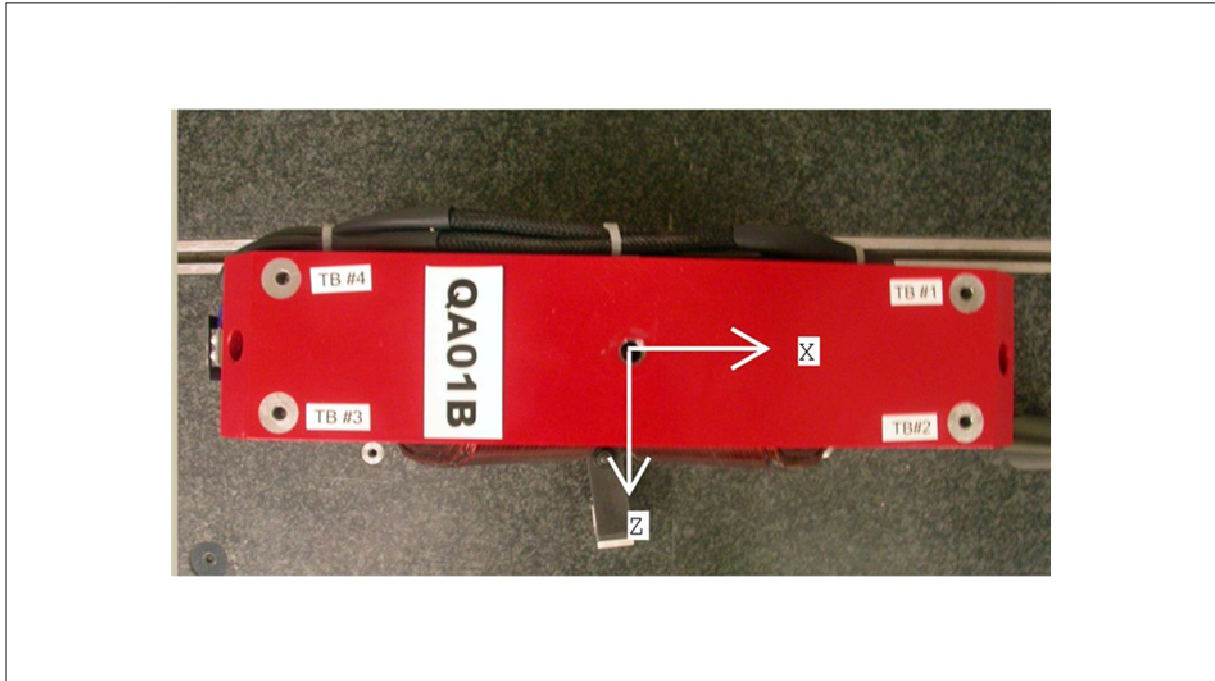
The Planar Alignment of the magnet is created by averaging the rotations of the composite best-fits of the upstream pole tips and downstream pole tips. This direction defines the Y and X directions of the magnet.

### **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 # : ' 002741**  
**Beamline Name: QM01B**

## Tooling Ball Locations



## Tooling Ball Locations

Tooling Ball	X Coord.	Y Coord.	Z Coord.
Ball #1	6.50019	8.88188	-1.25057
Ball #2	6.50073	8.88485	1.24935
Ball #3	-6.49925	8.88354	1.24814
Ball #4	-6.49884	8.88307	-1.25291

Tooling Ball Locations are 1 inch above unpainted surface pads

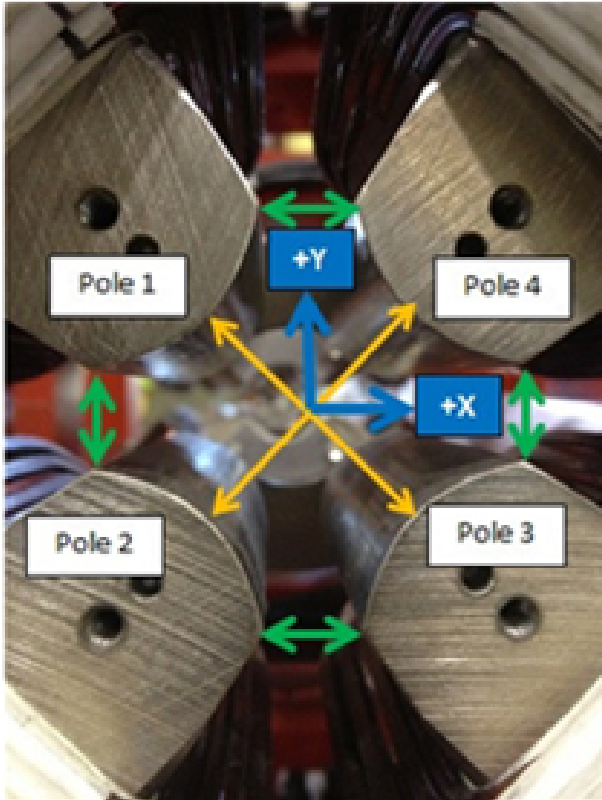
Dimensions in Inch

**Barcode # : ' 002741**

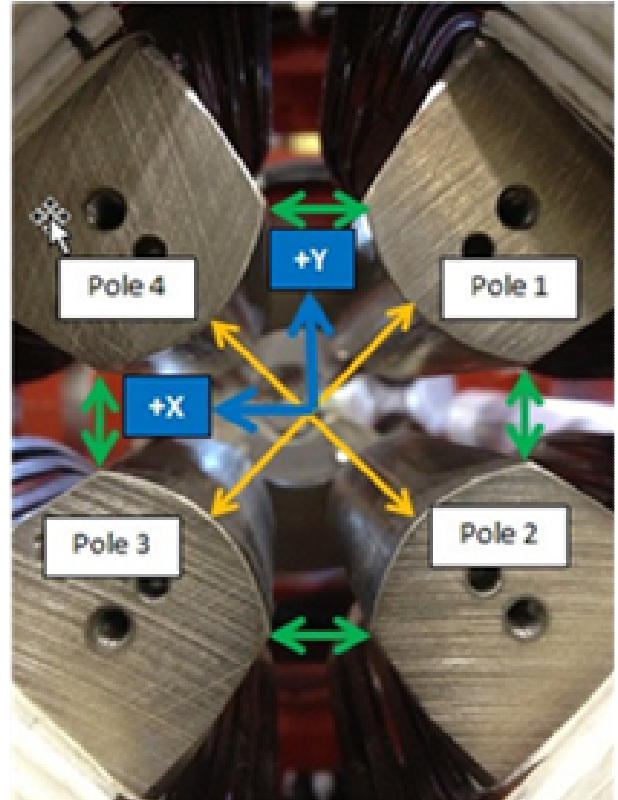
**Beamline Name: QM01B**

# Pole Tip Gap Measurements

**Pole Tips looking Downstream**



**Pole Tips looking Upstream**

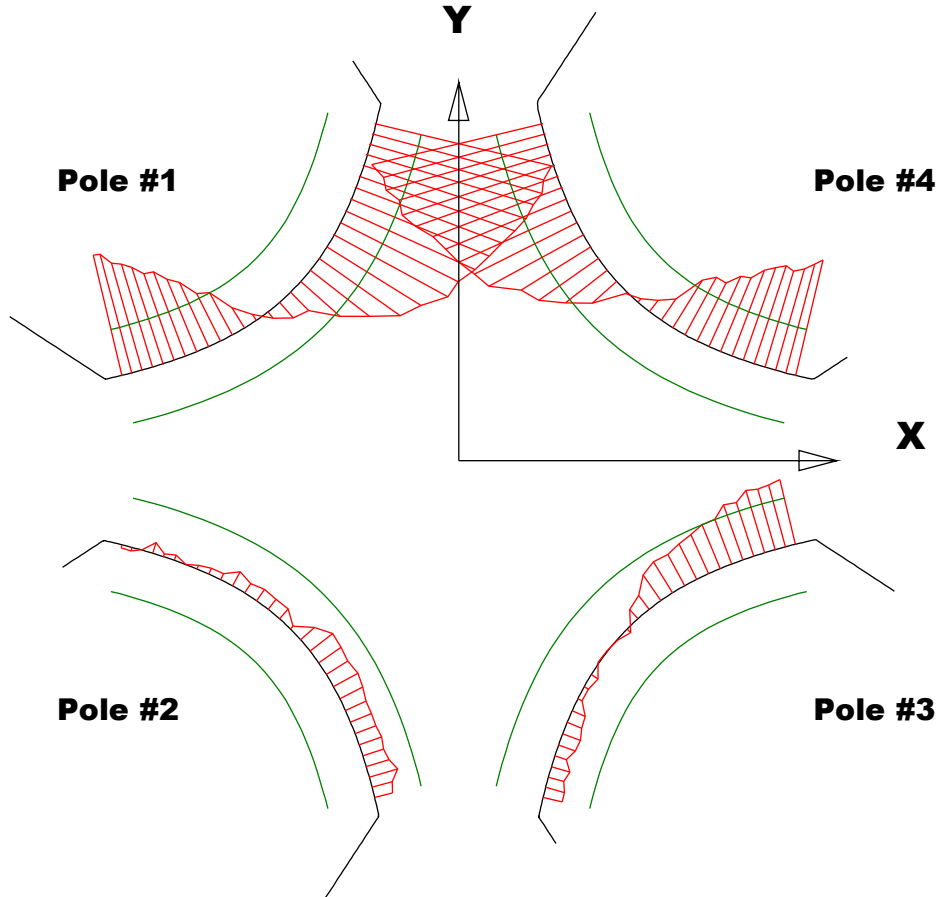


	Nominal Distance	Downstream Pole Ends	Upstream Pole Ends
Pole Tip Distance 1-3	1.260	1.25955	1.25953
Pole Tip Distance 2-4	1.260	1.25985	1.25983
Gap 1-2	.422	0.42716	0.42535
Gap 2-3	.422	0.42432	0.42428
Gap 3-4	.422	0.42508	0.42535
Gap 4-1	.422	0.41481	0.41628

Dimensions in Inch

**Barcode # : ' 002741**  
**Beamline Name: QM01B**

## Composite Best-fit of Pole Tips, Downstream



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

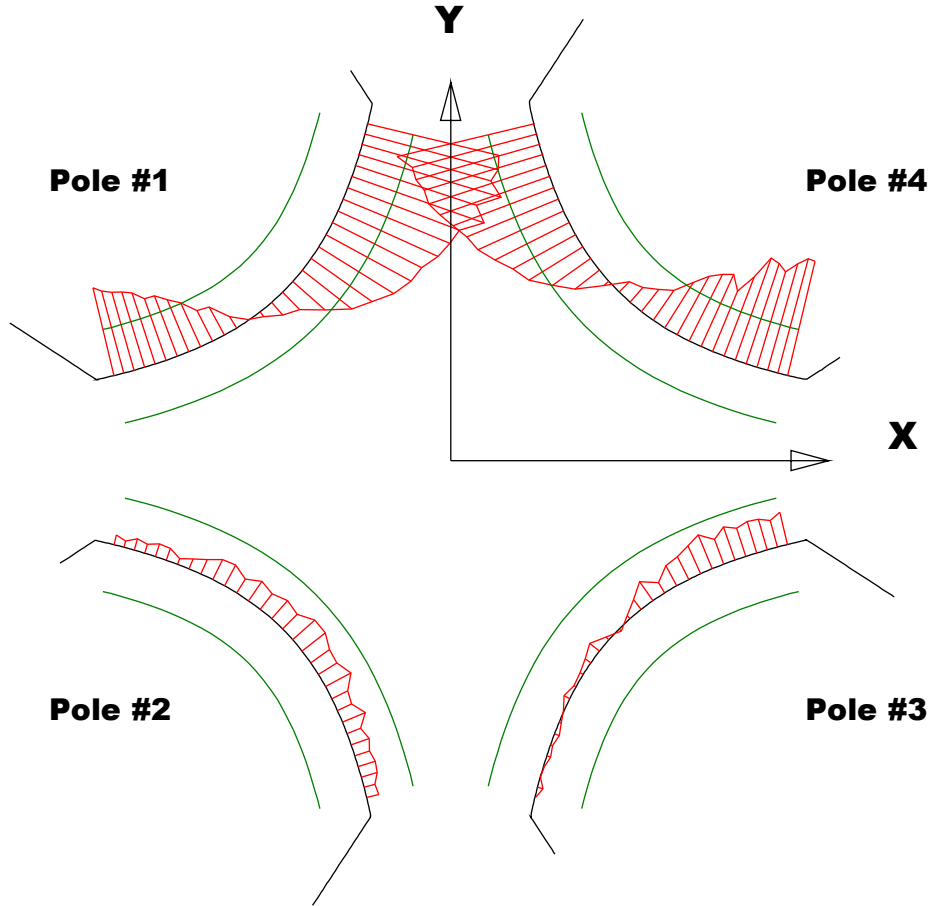
Dimensions in Inch

### Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00259	-0.00008	-0.00041	-0.00249
Max. Dev.	0.00379	0.00062	0.0014	0.00367

**Barcode # : ' 002741**  
**Beamline Name: QM01B**

## 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.	-0.0019	0.00013	-0.00012	-0.00248
Max. Dev.	0.00311	0.00062	0.00077	0.00295

**Barcode # : ' 002741**  
**Beamline Name: QM01B**