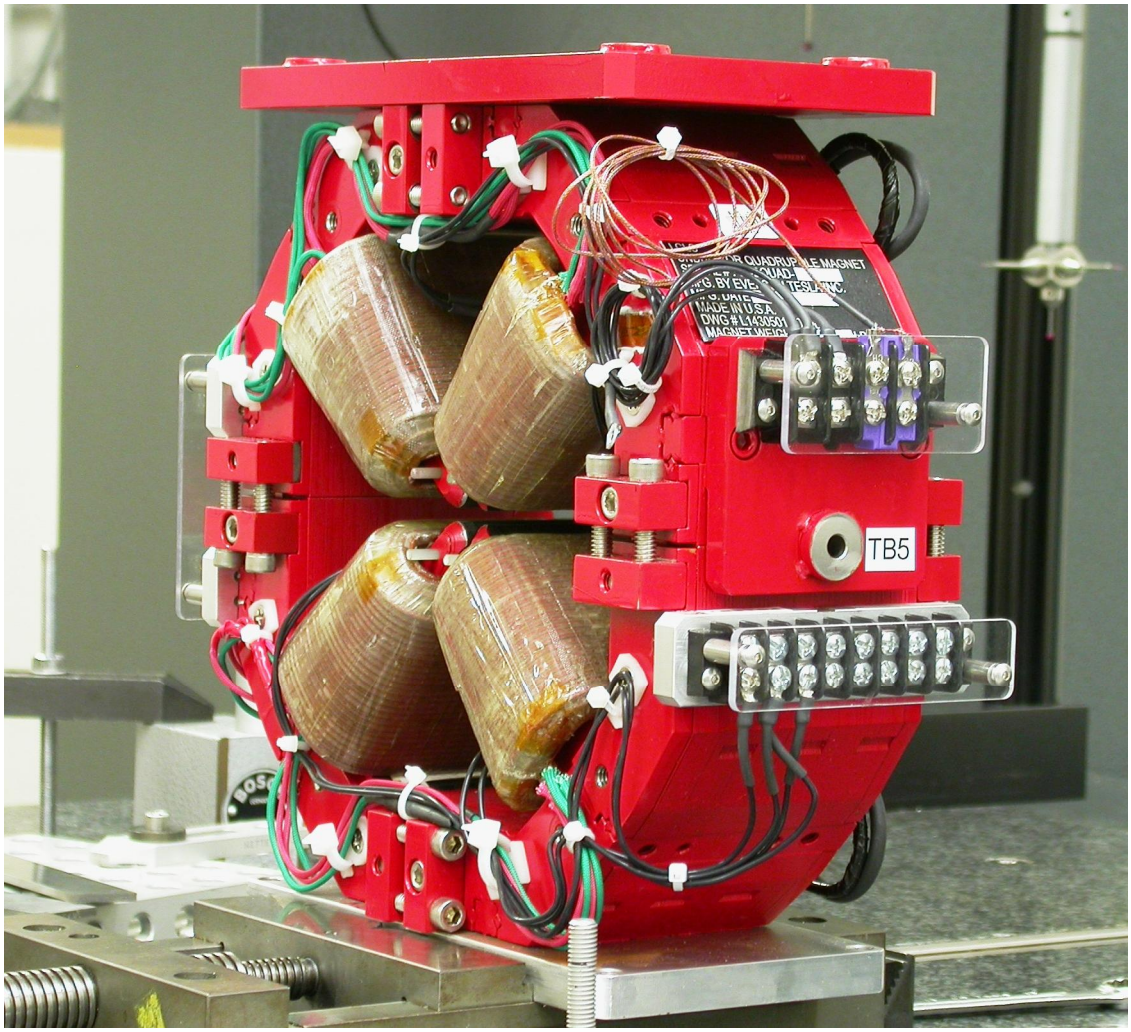
Linac Coherent Light Source

Stanford Linear Accelerator Center

Stanford Synchrotron Radiation Laboratory

LCLS Undulator Quadrupole Magnet FIDUCIALIZATION REPORT



Inspector:	Keith Caban
Responsible Engineer:	Scott Anderson
Date:	Wednesday, September 10, 2008
Work Order/Charge No.:	88-1400-5
Serial Number:	SLAC – 000709 / STAMPED – 30 (Re-Fiducialized)
URL of Fiducial Report:	http://www-group.slac.stanford.edu/met/Quality/FIDUCIAL REPORTS/LCLS UNDULATOR QUADS/000709_01.pdf

Part Set-up – Coordinate System Set-up

Spatial Alignment

- Geometric axis of the poles of the magnet.

Planar Alignment

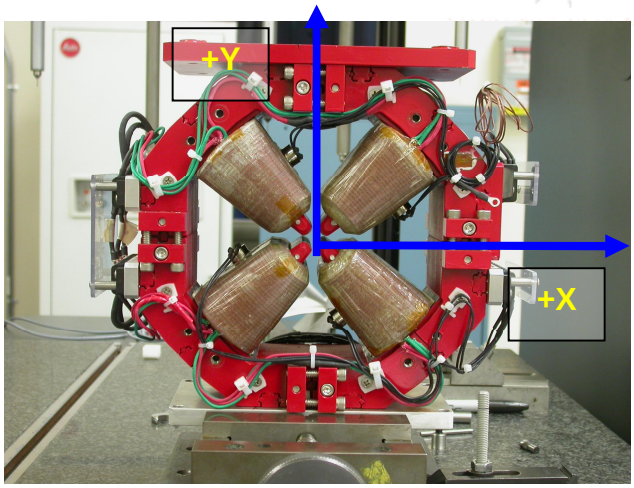
- Plane on where Aluminum Base Rests

“Z” Zero

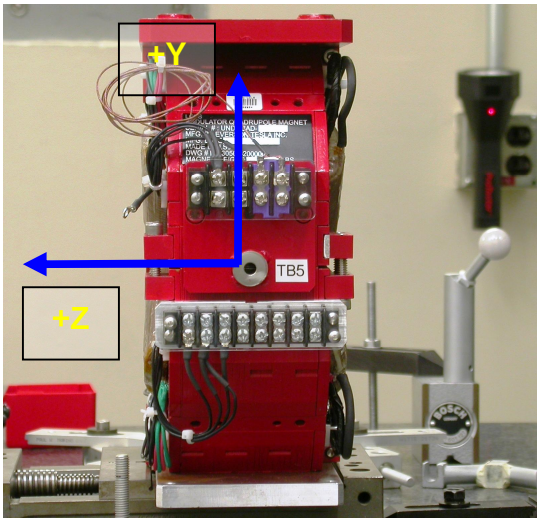
- Mid-plane of the magnet (middle of upstream and downstream ends).

“X” & “Y” Zero

- Geometric axis of the poles of the magnet.



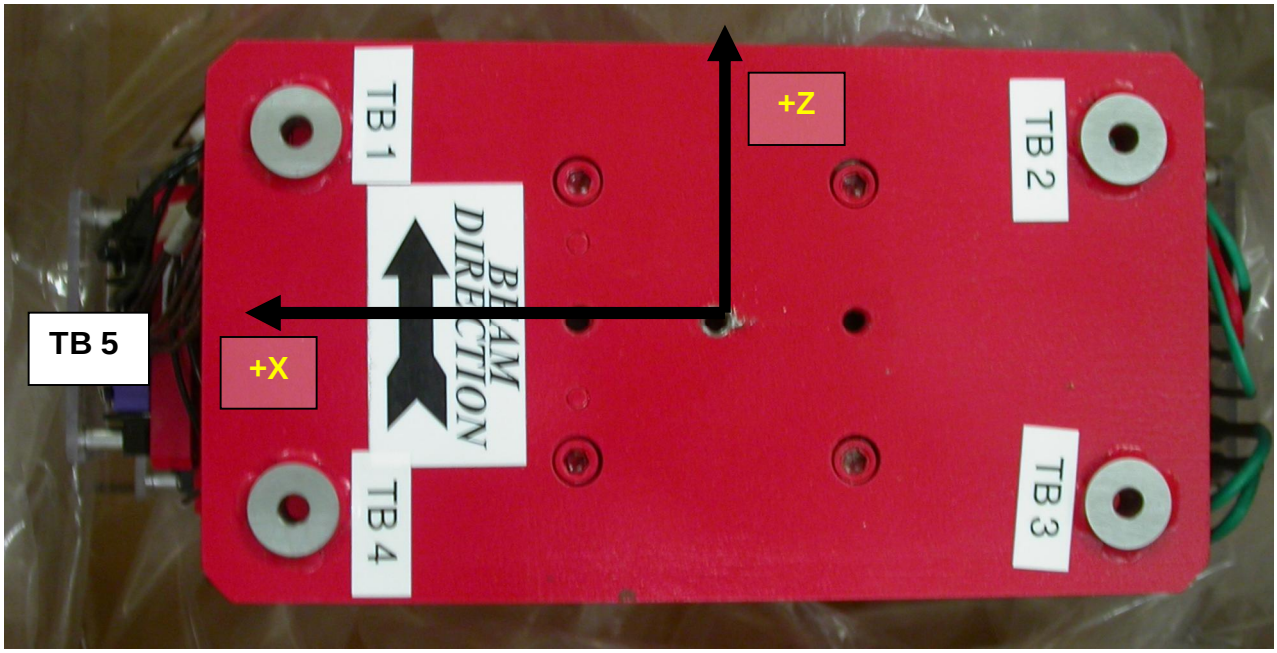
Front View



Side View

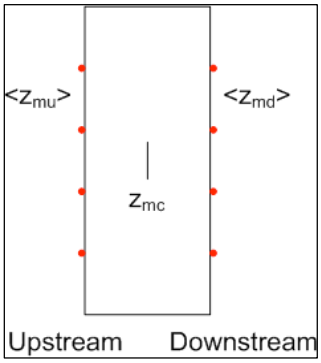
Tooling Ball Measurements/Locations

Top View looking from +Y



Tooling Ball Adapter Cylinder Projected 1" Offset to the Tooling Ball Adapter Plane

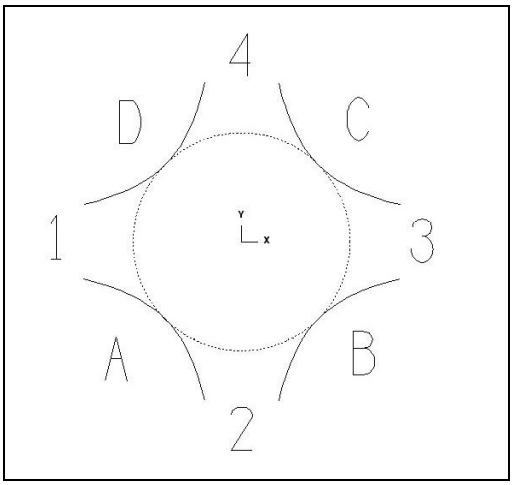
Tooling Ball	FORM	Cyl. Dia.	X	Y	Z	b
TB 1	0.00015	0.25004	3.37569	6.81250	1.48547	0.00005
TB 2	0.00015	0.24995	-3.37627	6.81234	1.49546	0.00012
TB 3	0.00020	0.24991	-3.37990	6.81179	-1.50388	0.00016
TB 4	0.00016	0.24996	3.36877	6.81311	-1.51257	0.00007
TB 5	0.00013	0.25015	6.57795	0.13165	0.00589	0.00007



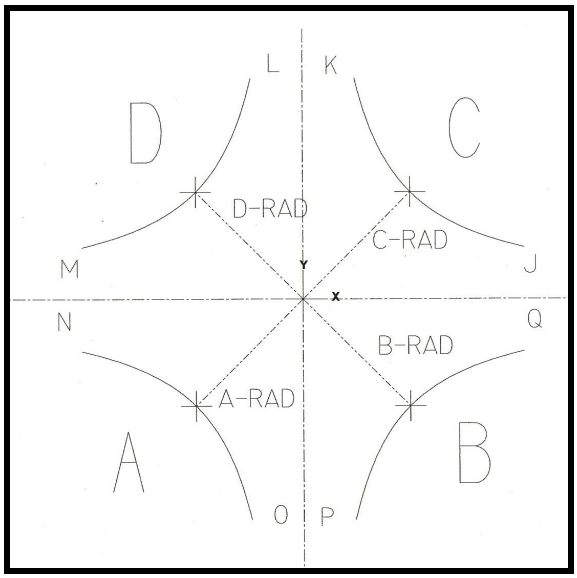
Z-distance of Quad = 3.59443

Pole Tip Additional Data

*Data looking from Downstream End



Side	Pole Dist A-C	Pole Dist B-D	Gap 1	Gap 2	Gap 3	Gap 4
Downstream End (+Z)	0.43417	0.431103	0.16021	0.15799	0.16031	0.15797
Upstream End (-Z)	0.43209	0.43277	0.15477	0.16237	0.15702	0.16203

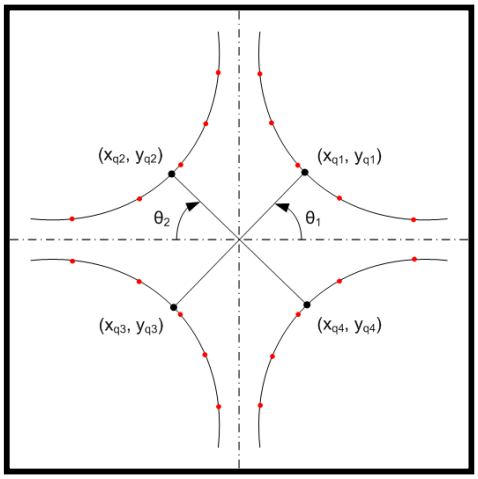


Side	A-Rad	B-Rad	C-Rad	D-Rad
+Z	0.21859	0.21553	0.21558	0.21552
-Z	0.21607	0.21667	0.21602	0.21610

Side	J	K	L	M	N	O	P	Q
+Z	0.08152	0.08120	0.07676	0.08084	0.07938	0.07932	0.07867	0.07879
-Z	0.07839	0.08006	0.08197	0.07627	0.07850	0.08084	0.08153	0.07863

Quadrupole Roll Angle

** Tolerance in milliradians is ± 5



Roll of the Base of Quad to Poles θ_1

$$\theta_1 = 0.02428°$$

$$\theta_1 = 0.42368 \text{ milliradians}$$