

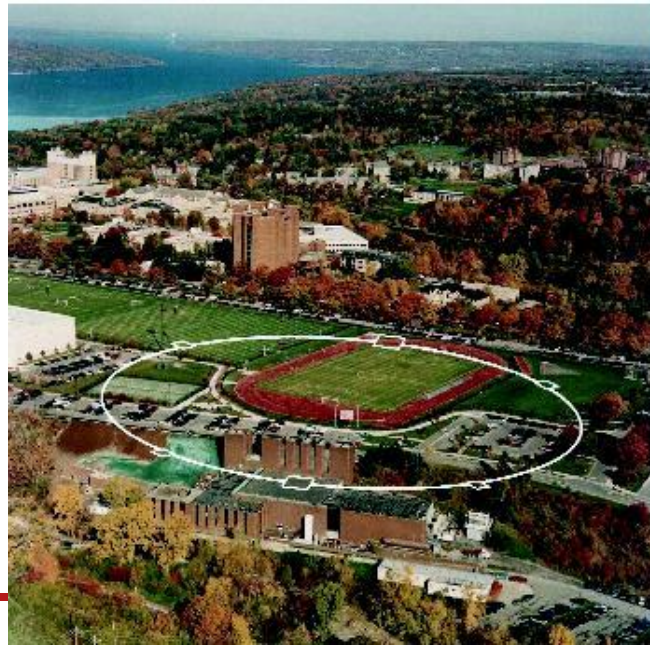


Cornell Laboratory for
Accelerator-based Sciences and
Education (CLASSE)

DR Magnet and Layout Summary

April 24, 2012

Joe Conway





- 8 magnets designed since RDR

Common Name	Eng name	Qty	Max I A	Max V	Ov Len cm	Steel L cm	L eff cm
"3m" dipole	D60L2940	150	173.25	26.52	309.4	294	300
"2m" dipole	D60L1940	8	83.61	27.05	208.6	194	200
"1m" dipole	D60L940	28	113.5	20.45	108.6	94	100
"Arc" quad	Q60L480	482	65.6	22.4	57.4	48	51
"Trapped" quad	Q85L309	30	59.9	19.05	40	30.9	35.15
"Wiggler" quad	Q85L600	30	32.8	15	69.1	60	64.25
"Straight" quad	Q60L700	121	18.5	9.41	79.4	70	73
Sextupole	S60L150	600	5.6	3.63	18.3	15	17.4

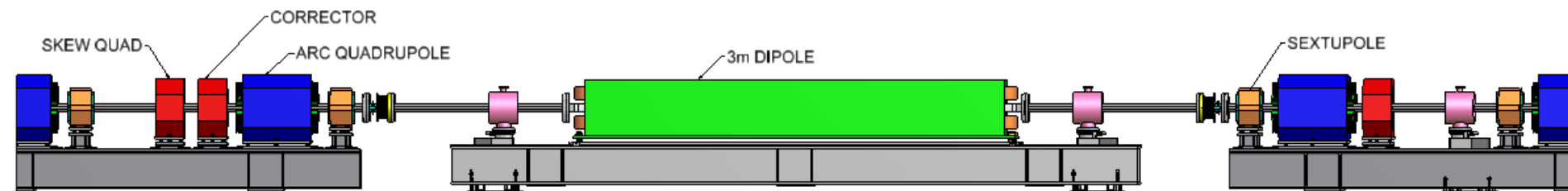
“trapped quad” = quad trapped between 2 wigglers

“wiggler quad” = quad between wigglers, near photon stop

“straight quad” = quad in chicane cell and all other straights

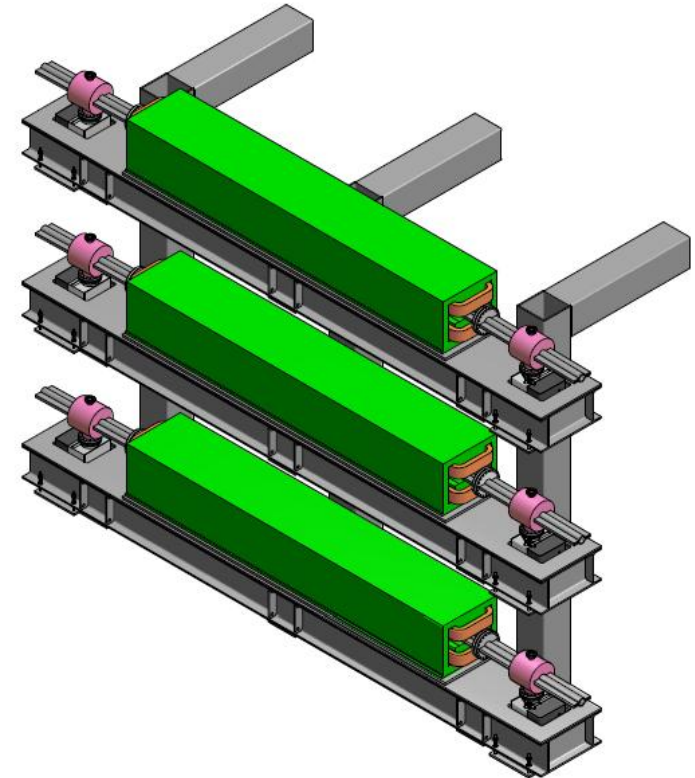
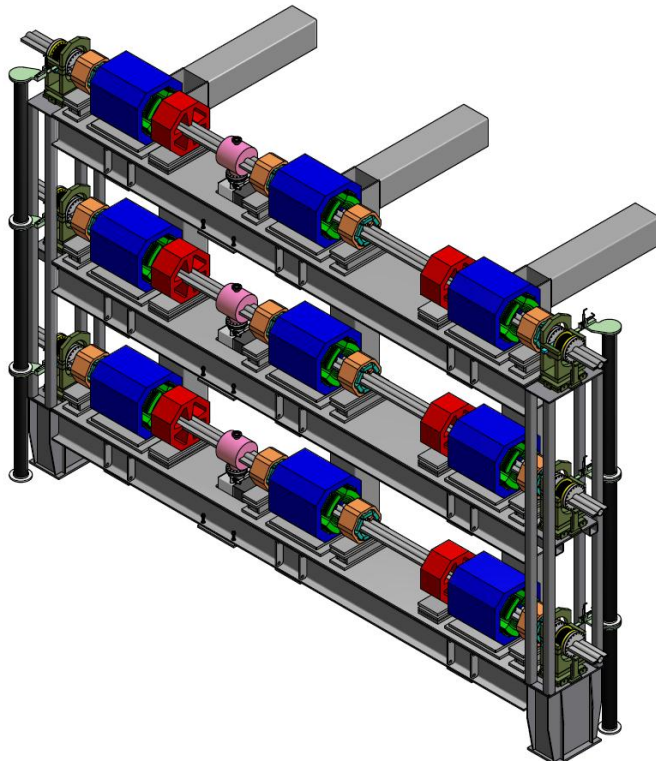
From Cherrill Spencer

- Single Arc Cell Shown – 75 total per arc, 150 per ring



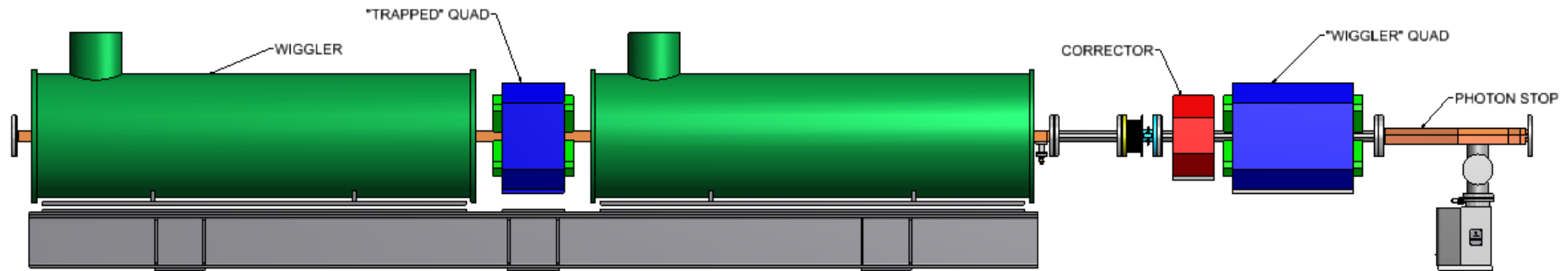
- Cell shown as defined in lattice file: from Q02H to Q02H
- Correctors and skew quads taken directly from RDR design

- Magnets pre-assembled on I-Beam and transported into DR
- I-beam system used in Arcs, Wiggler Section, Chicane
- Allows for most alignment to take place outside tunnel

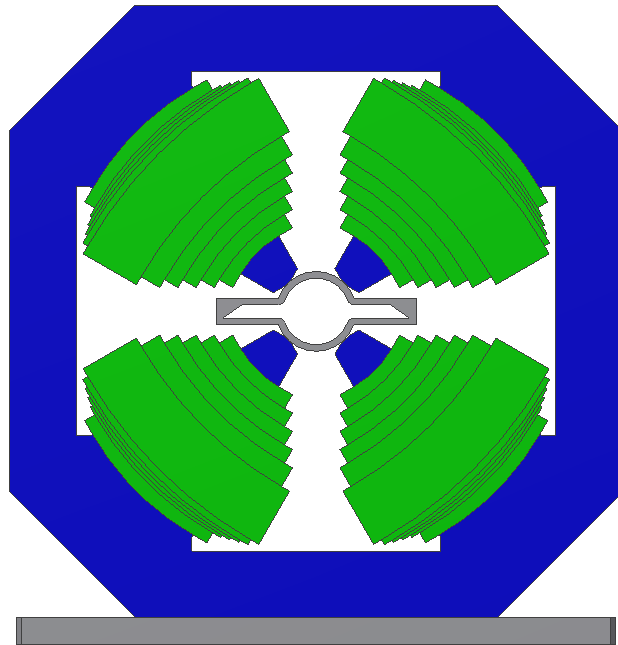


Three ring optional upgrade shown

- Single Wiggler Cell Shown – 30 per ring

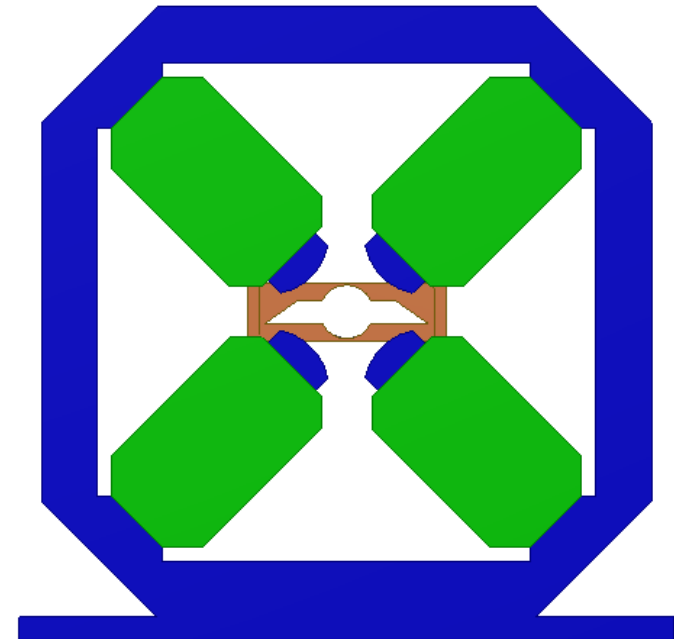


Q60L480 – Arc Quad
Q60L700 – Straight Quad



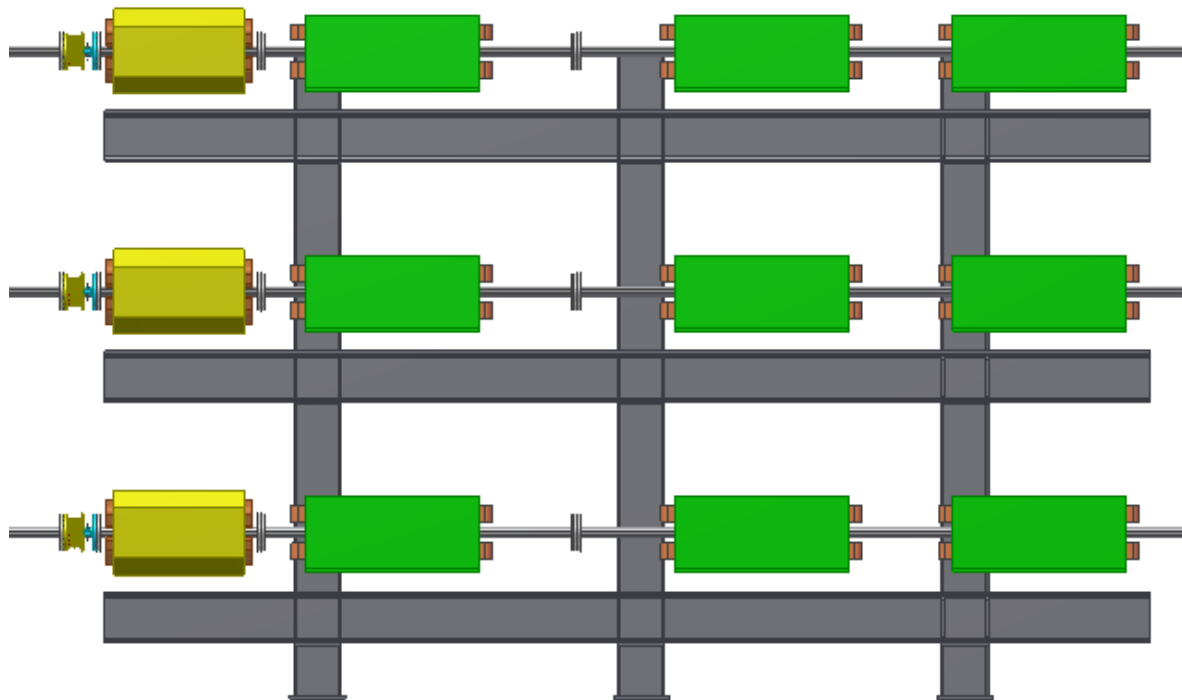
Notice sloped walls of
antechambers to reduce photon
reflection

Q85L309 – “Trapped” Quad
Q85L600 – “Wiggler” Quad



Increased magnet aperture needed
to accommodate 2cm antechambers
in Wiggler Straight vs 1cm tall
antechambers in Arcs

- Single Chicane Cell Shown – 9 per ring?



- Optional third ring upgrade shown



- Arc Cell vacuum ion pump support strategy – don't trap in beam – want to be able to remove beam + magnets without breaking vacuum
- Check number of dipole magnets in lattice. 4 cells of 6 magnets in chicane, where do other 2 1m dipoles in magnet counts come from?
- Vacuum chamber external design optimization – optimized extrusion shape vs post machining
- Arc cell beam support strategy – support from below, 4 point adjustment system?
- Need to do injection/extraction straight detailing