Fringe Field Study

Optics Group Meeting
08/04/2016
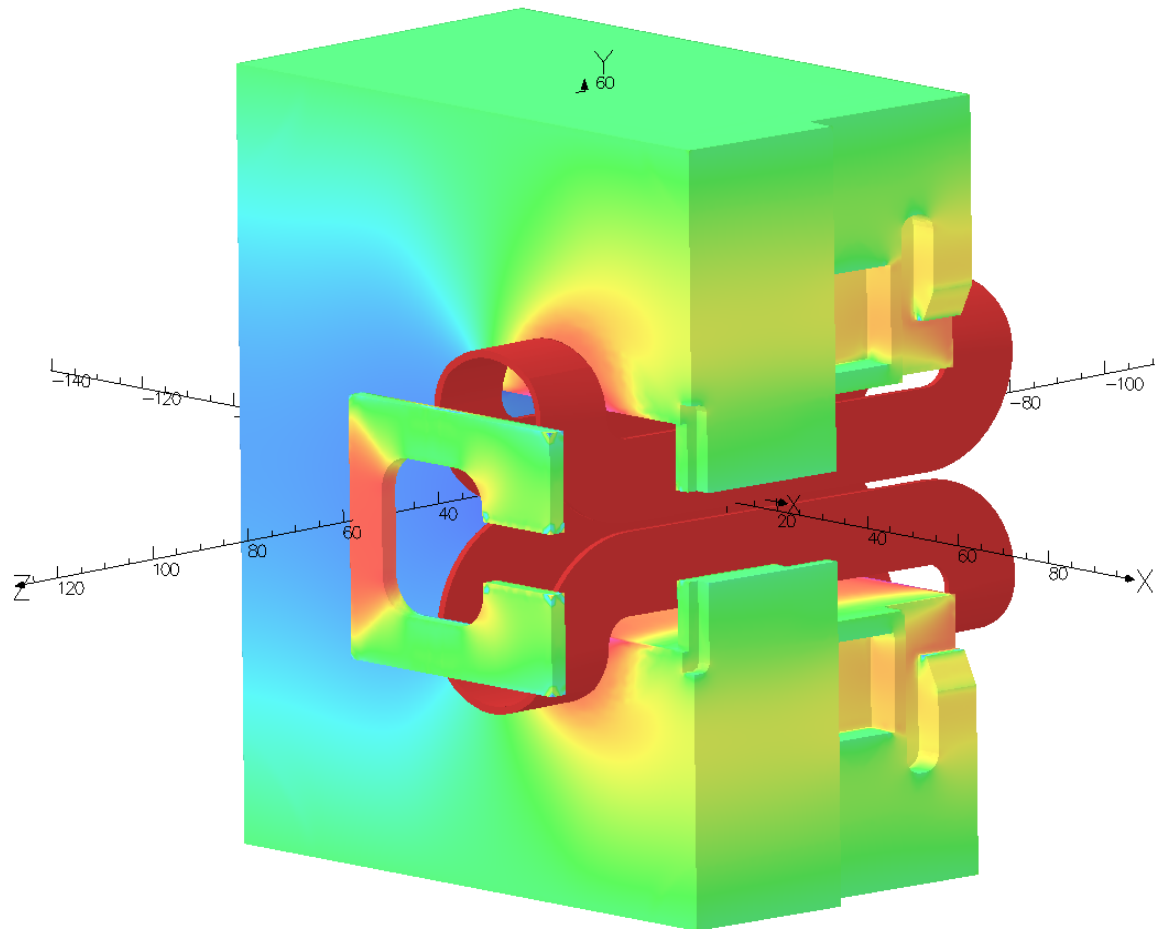
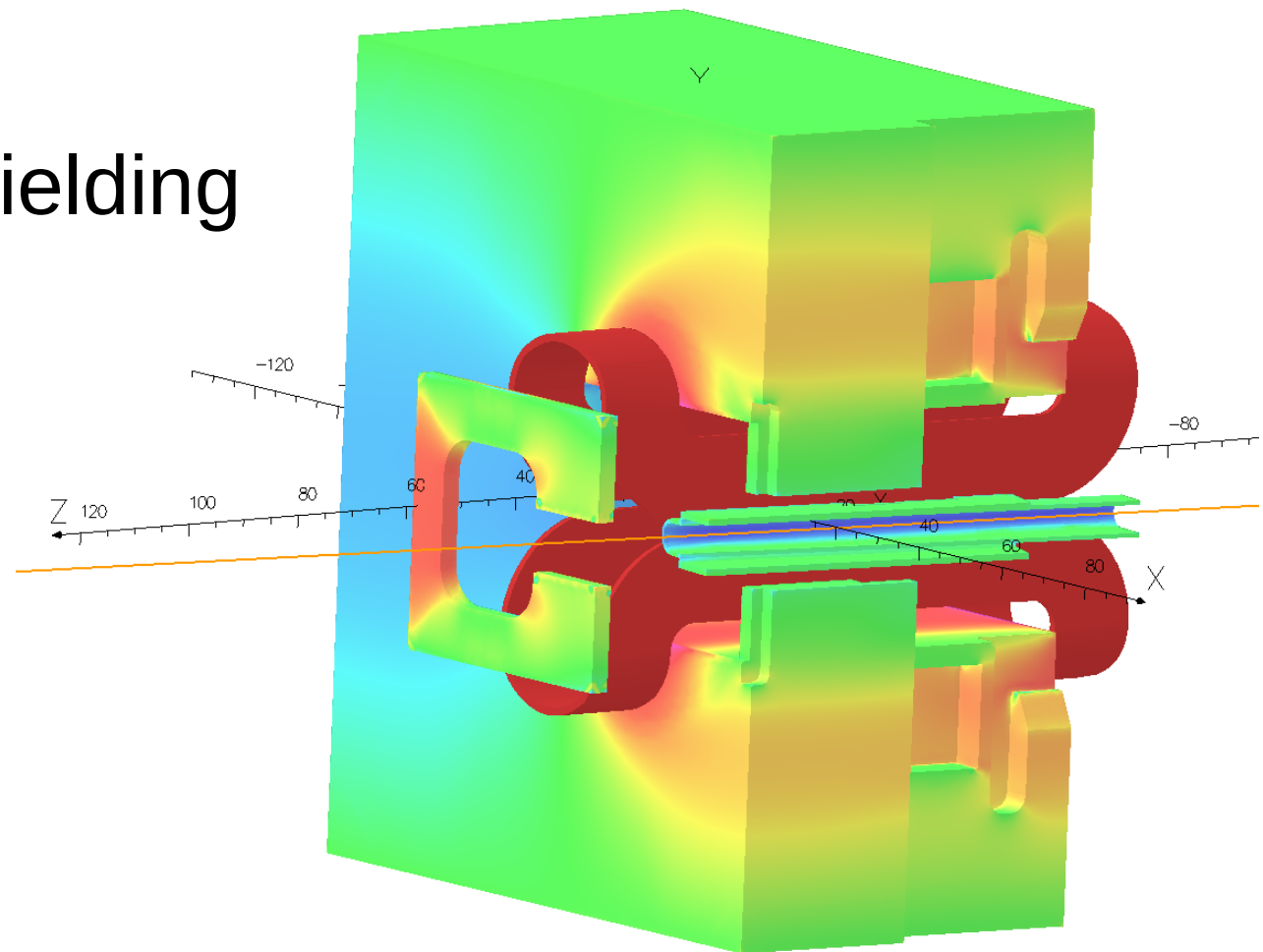Jure Bericic

Jefferson Lab

HB models :: v9.3

- extended yoke
- front clamp

HB models :: v9.4

- extended yoke
- front clamp
- beamline shielding

Q2 models

- unshielded

- half-shielded: unshielded / 2

- perfectly shielded: no fringe fields

Field maps

- got field maps from Lassiter

- /group/hallc/shms-field-maps/tosca-Jul2016

- maps are calculated in their respective Tosca coordinate system

- made Python library for manipulation

excitation	HB	Q1	Q2	Q3
11.0	11.3	11.18	11.33	10.92
10.0	*10.0* *	10.24	10.33	9.97
9.3	9.4 9.0	*9.3* *	9.33	9.00
8.2	8.3	8.18	8.29	7.99
7.5	7.6	*7.5*	*7.5*	*7.5*
6.6	6.7	i	i	i
6.0	i	6.04	*	i
5.0	5.0	i	i	i
3.8	3.8	3.99	4.13	3.98
2.0	*2.0* *	1.99	2.11	2.03

- *: asked Lassiter for these also
- i: can interpolate
- italics: interpolated

Spliced maps

- need to properly rotate and translate field maps

- check for polarity of magnets

- this configuration corresponds to negative polarity
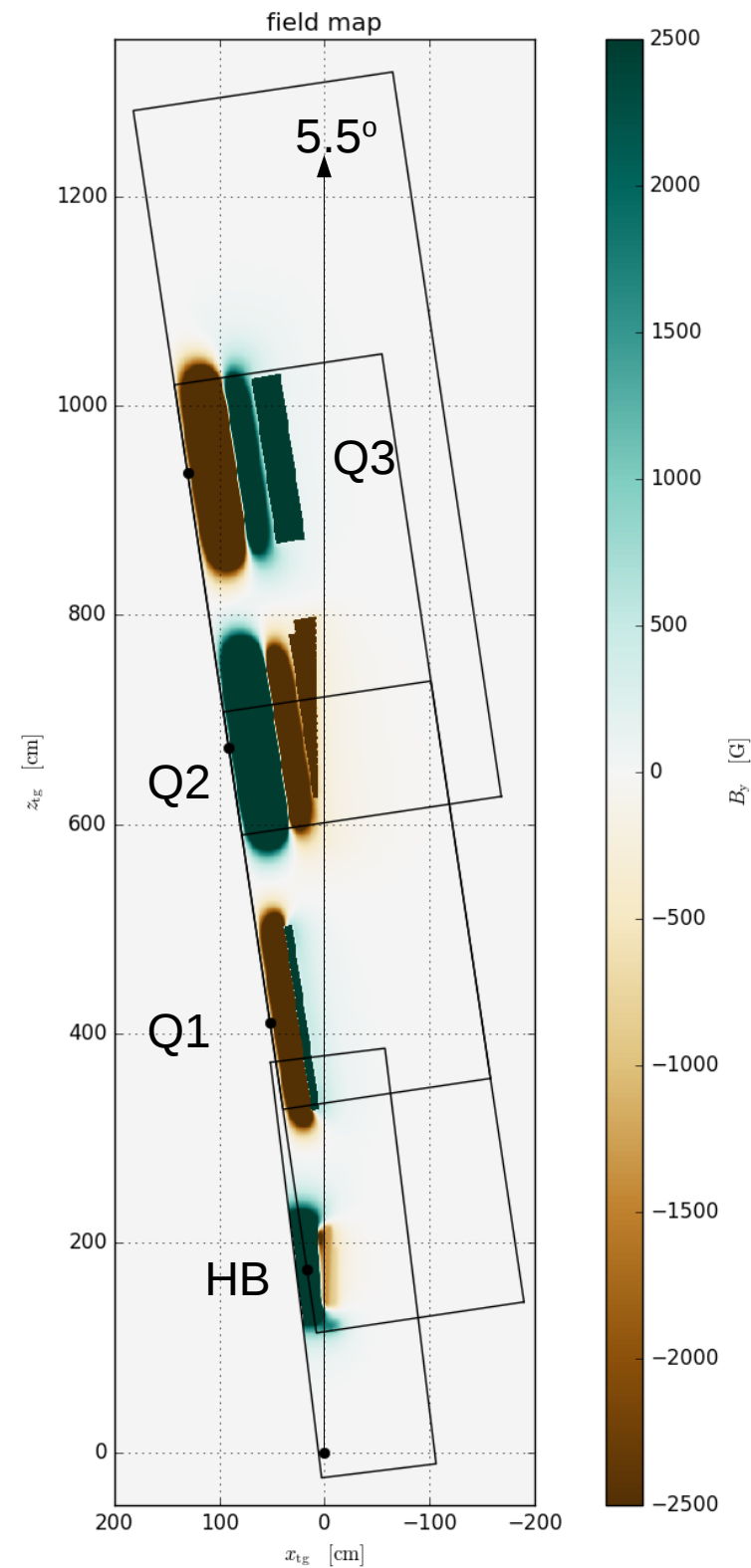
Simple raytracer

- made a simple raytracer to get the beam deviation at the beam dump (51.8m from target)

- takes into account local deviations from straight path

- for now traces only in x-z plane and accounts only for B_y

- produced table of int.Bdl and beam deviations for different field excitations and angles

HB=v9.3 Q2=unshielded P=11.0 E=11.0 pol=n

FC   HB   Q1   Q2   Q3

HB=v9.4 Q2=unshielded P=11.0 E=11.0 pol=n