

CEBAF Beam for KLF

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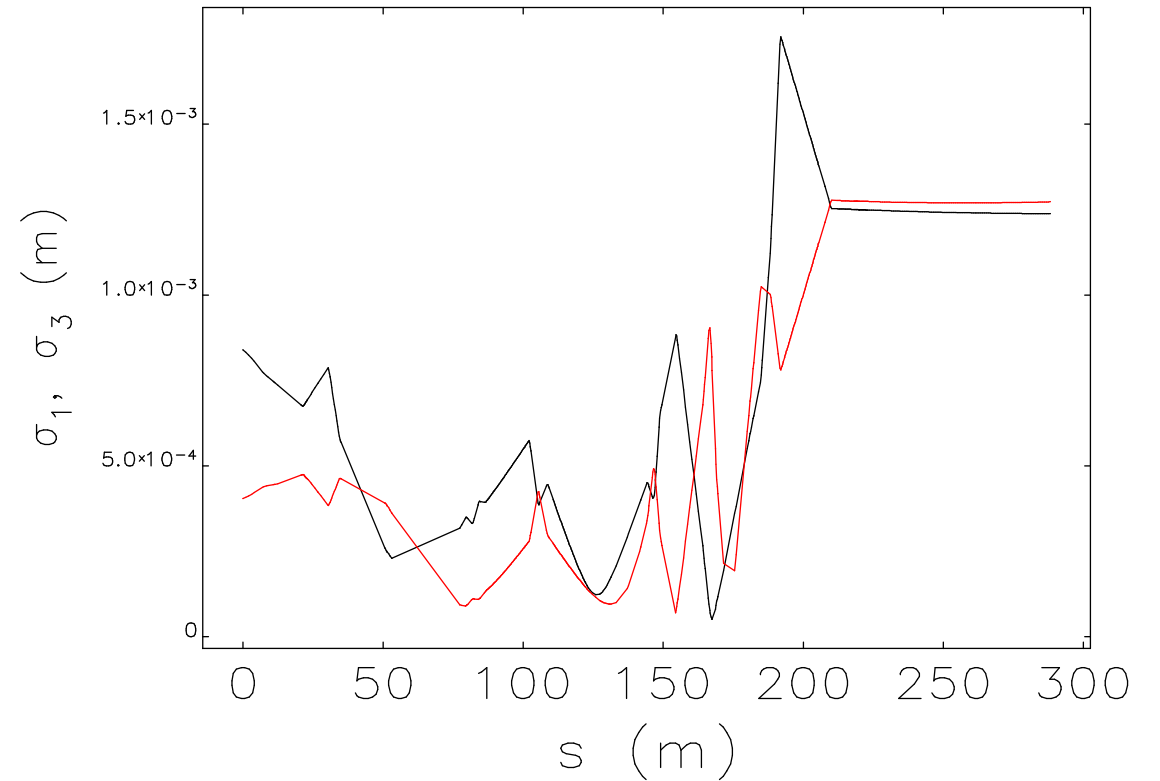
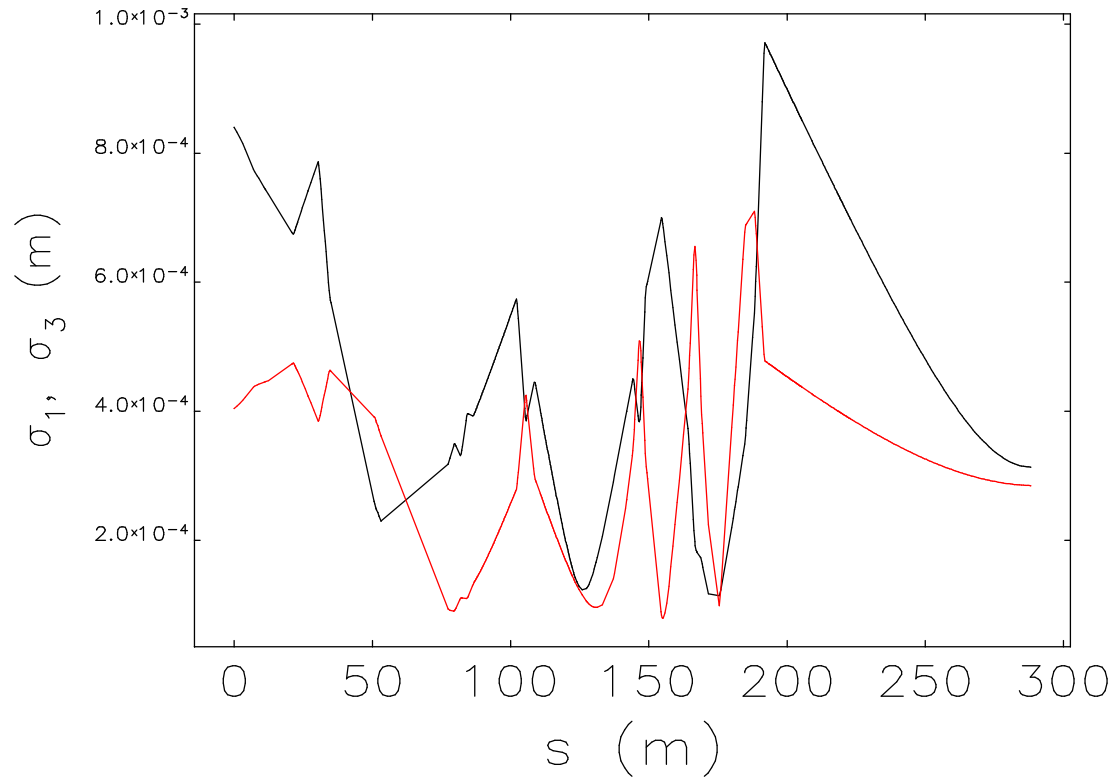
Bunch Spacing from the injector group

- Work done in the UITF for the harmonic kicker project is directly applicable to the needed bunch spacing
- Shukui Zhang will be giving a detailed update on that later in this meeting

Spot Size on the CPS (parameters)

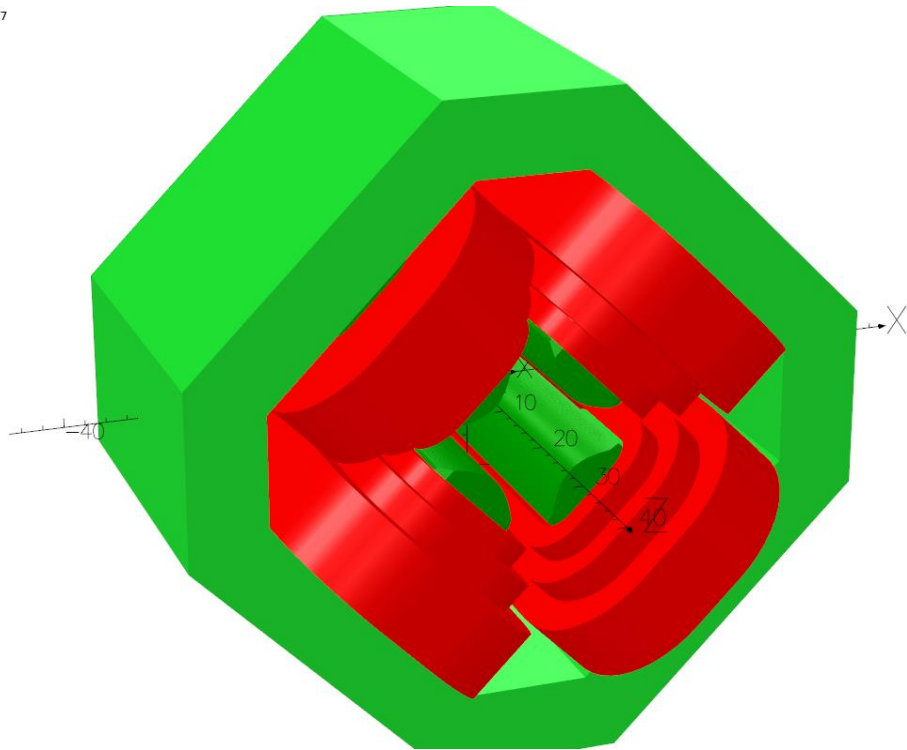
- The CPS target face is $\sim 11.5\text{m}$ from the radiator
- The spot size should be between 1 and 2 mm RMS
 - This is due to thermal issues
 - Could also be solved through a rastering system
- The spot size on the active collimator should be less than 1 cm

Spot Size on the CPS (Possible optics plans)



Spot Size on the CPS (Magnet size)

1/Dec/2020 20:08:37



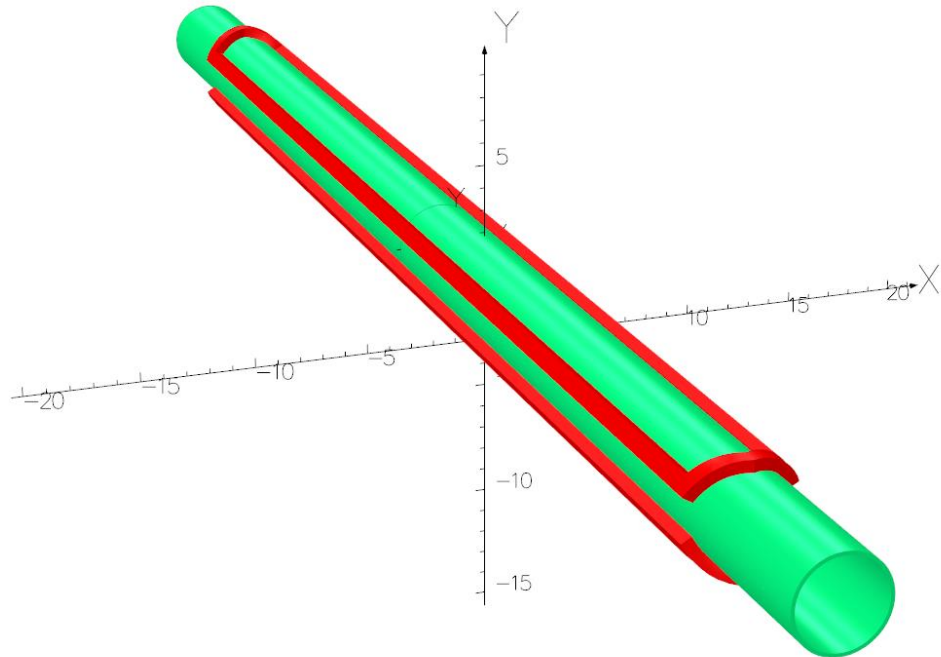
- Since the optics solutions will require larger beam sizes within different magnets there may be a need for larger bore magnets
- Designs are available like this one, which was designed for the Moller experiment
- See: JLAB-TN-20-44

Possible Raster

- Instead of/ in addition to blowing up the distribution a potential raster has been suggested
- This would have a diameter of 2mm
- The beam would still need to be moving parallel to the centerline of the machine at the CPS face. This would necessitate 2 sets of kickers

Possible Raster (kickers)

13/Oct/2020 12:57:21



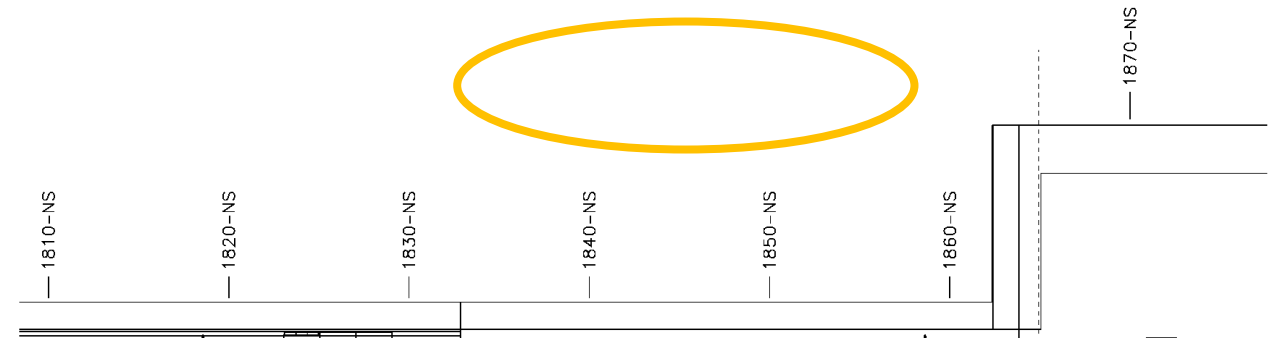
Opera
Simulation Software
COBHAM

Frequency Hz	BdL at 110 AT, G-cm
DC	2294.44
60	2293.91
120	2293.33
180	2292.35
960	2245.15

For more info see JLAB-TN-20-035

Possible Raster (kicker placement)

- The best area to put these kicking elements would be in the gap between VRVSC11B and IPM5C11B, providing an area between 4.75m and 12.56m from the diamond radiator IARAD00
- The second set of kickers would be on the other side of the radiator as close to the CPS as possible
- The beam pipe in this section would need to be changed out since the existing one is too large for these kickers



Electron mass	meV	0.511
Electron KE	MeV	12000
Total E	MeV	12000.511
P	MeV/C	12000.5109891204
Clight	M/s	299792458
Brho	Tm	-40.0293959000143
Bdl		0.002200
l		1
Theta		-0.0000549596103197554
distance to Rad		10
Distance Rad to target		10
Size		-0.00109919220639511

What do I need from you

- I am an accelerator physicist, so I need help with nuclear/particle issues
- Do we have tighter restrictions on the parameters?
- Which is more important? A raster or an optics strategy? Both?
- Are we able to add new quads?
- What are the requirements of the virtual electron beam downstream of the CPS?

- What do you need from me?

Thank you for your attention