FFA@CEBAF Working Group|Minutes

Meeting date | time 6/10/2022 | 11 AM EST | Meeting location  <https://jlab-org.zoomgov.com/j/1614898082?pwd=TnUzMS81M2sxbDZIbERJU01tYkJCQT09>

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| Meeting called by | Alex B |
| Type of meeting | Weekly Meeting |
| Facilitator | Alex B |
| Note taker | Alex C |
| Timekeeper | Alex B |

 | AttendeesAlex B, Alex C, Kirsten, Jay, Scott, Kitty, Dejan, Eric Voutier |

# Intro Discussion

# Agenda topics

## Time allotted | 25 minutes | Agenda topic Emittance Dilution Budget | Presenter Kirsten

* Particle tracking and radiation integrals with Bmad lattices
	+ Sagitta shift helped us understand FFA lattices from Stephen
	+ Assume the arc spans less than 180 degrees
	+ Particle tracking uses the established CEBAF emittances
	+ No longer getting a relative energy spread of 0.01
	+ Kirsten has a spreadsheet with emittance data (below)



* Scott mentions that large energy gain is basically helpful for FFA arcs
	+ Baseline is 1100 MeV per linac
* Simulation uses normalized initial emittance of 80 mm mrad
	+ Different initial emittance may affect this substantially
	+ Not completely conclusive which exact initial parameters should be used
* Not yet sure about consistency in Synchrotron radiation loss.
* Simulation agrees with energy loss to the order of magnitude
	+ Radiation integral and beam tracking methods agree pretty well ~10%
	+ More energy loss in particle tracking
* Energy cap seems to be 22.3 GeV, which indicates 1.2 GeV per Linac is too much
* Most of the emittance growth is in FFA2
	+ Last three passes in FFA1 also contribute
* Simulation only considers arcs, no spreaders etc.
	+ Future work should maybe assume 180 deg. for accuracy because splitters contribute a lot to emittance growth
* Per Scott, initial design will have one splitter line per arc
* Jay gives normalized emittance after 4 passes through the north Linac
	+ Higher energies available also
* Discussion of FFA arcs at LHeC, optimization was very difficult.
* Energy spread expected in the CEBAG halls ~10-4
	+ 3-4 GeV experiments want 2\*10-5
* Verdict is that we can fit this emittance in the hall lines (probably)
* Small time of flight might allow us to reduce the number of splitters (Dejan)
	+ Adiabatic matching could reduce it further
	+ Scott urges caution about making assumptions
* Regardless, the emittance simulation is hanging together.

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## Time allotted | 10 minutes | Agenda topic AOB | Presenter All

* NO MEETING NEXT WEEK
* Bogden called Jay and asked if positrons could be handled by flipping the permanent magnets

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| Action items | Person responsible | Deadline |
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## Special notes