FFA@CEBAF Working Group|Minutes

## Meeting date | time 05/31/2024 | 11 AM EST | Meeting location <https://jlab-org.zoomgov.com/j/1614898082?pwd=TnUzMS81M2sxbDZIbERJU01tYkJCQT09>

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | Meeting called by | Alex B | | Type of meeting | Weekly Meeting | | Facilitator | Alex B | | Note taker | Ryan | | Timekeeper | Alex B | | Attendees  Alex B, Ryan, Todd, Salim, Randika, Kirsten, Alex C, Stephen, Donish, Edy, Dejan, Nick, François, Andrei, Tim |

# Intro Discussion

* Short meeting
* HUGs tour

# Agenda topics

## Time allotted | 25 mins | Agenda topic LINACs| Presenter Alex B

* Last time, presented strongly focusing linacs
* Will show the summary
* Table

  Description automatically generated
  + This is from last summer
  + To read this, started with pass 5 (FFA Passes). Not at linac, but recombiner/spreader is start
  + Values from beginning of Recombiner and end of Spreader
  + Stephen – what you’ve done is the right thing but called it the wrong thing.
    - Maybe call extended LINAC or Spreader points.
* Odds are East, Evens are West
* Chart

  Description automatically generated
  + NL – enters at 650 MeV – make first pass flat with triplets
  + All other conventional passes follow semi-periodic plot
    - Higher passes drop b/c of scaling chosen
  + This is JUST LINAC PROPER – not extended
* A picture containing diagram

  Description automatically generated
  + 4 EM passes separated out, 6 passes through FFA
  + 6-point chicane – for higher FFA passes, extended NL with SW recombiner and NE spreader
* Chart, line chart

  Description automatically generated
  + Different error function and monte carlo to find Twiss.
  + Now, including recombiner and spreaders
  + “explore beta beating”
  + Morph into FODO lattice
  + Previously, put alphas = 0, but now, open that up
* In Monte Carlo, was feeding Twiss functions with some distribution to get small values at ends
* **Chart

  Description automatically generated**
  + Assymetry b/w Horizontal and Vertical phase advance, and wrong slope for function
* Chart, line chart

  Description automatically generated
  + The Betas are confined pretty well with this optimization
  + Trying to put nodes at ends and confine max betas
* **Table

  Description automatically generated**
  + May change labels
  + More balanced now
  + Betas well below 100 m
* Ryan – did you use the newest OptiM files provided by Donish? They were aligned with CED already.
  + Alex B – yes, used those files. Donish will process them.
* Donish – yes, I’m processing them now.
  + Will be elegant, OptiM, Bmad
* Ryan – could you share the Monte Carlo code in case we need to re-optimize?
  + Did this in Matlab – still experimental, but will clean up and share eventually.
* Dejan – very impressed. 75 m was the largest Beta?
  + You’re right.
* Big different with input energy of 175 – so quads much stronger b/c high energy input. But cannot do that in the other LINAC b/c the energy range is smaller
  + Yes – start with NL at 650 MeV and go to higher energy
  + For SL start at 1.7 and go to 21 GeV – scaling gives nicer optics.
  + Larger injection energy, smaller beta
  + 11 pass – got feature where get half of the wave – two nodes and one mode at middle
    - Mode is still within aperture of LINAC
* Dejan – now concerned with plans to get R56 to zero with LDRD
  + Let’s suppose we fix that – still have to match Betas
  + Need splitters
    - Ryan – yes, still need them
* Ryan – spoke with Stephen and R56 may actually be adjusted in FFA arc
  + Stephen – noticed ToF changed by order of 2 in some of the other FFA arc designs. Maybe not R56, but could be looked at.
* Dejan – 5 elements to change R56
  + Still need to match into FFA from LINAC
  + Need splitters
* Stephen – relative ToF change is 2 parts in 10^4, was 3.9 parts in 10^4 – almost halved ToF different among FFA arc
  + Likely b/c cell got shorter, so smaller orbit excursions.
* Alex B – will update or make reading instructions for table
* Stephen, got improvement with linear lattice without sextupoles
  + Sextupoles could make it go even smaller.

|  |  |  |
| --- | --- | --- |
| Action Items | Person responsible | Deadline |
|  |  |  |
|  |  |  |

## Time allotted | 25 mins | Agenda topic AOB | Presenter All

* Dejan – didn’t like IPAC talks – nothing connected to our field.
  + Didn’t have many talks, no talks for CEBAF upgrade
  + Spoke with Manoucher a couple times. There were two meetings already toward making decisions. Didn’t say anything specific.
  + Mentioned to SBIR people that Stephen made deal to make permanent magnets
    - Sabr (sp?) enterprises in MA – was at FFA workshop industry session
* Who is delegation to DOE?
* Dejan – suggestion to Michelle Shin – invite company to meeting. If present, could realize other options.
* Timur is looking for PM upgrade – similar trajectory as us. Started with LDRDs, has to ramp up. Will use departmental funds
  + He’s getting his from BESAC instead of NSAC
* Dejan – Timur et al want to participate
  + Placing magnets in Xray beamline
  + Experts on getting SR out of small slots
* KYMA giving PM workshop
  + Everyone is afraid of radiation
  + Always mixing iron and PM before iron – CBETA looked at this but gave up
  + People are hesitant about Halbachs
* Stephen will be part of someone’s LDRD related to this
* Stephen – told Timur about Ryan’s LDRD, but we should coordinate
  + Ryan needs a two-axis platform to do field maps
  + Joe Meyers may have what we need already
* Ryan – interesting new device from GMW – essentially an array of hall probes to quickly field map (low accuracy, but fast).
* Ryan – looked into CERN facility tests (CLEAR etc), may be able to get “free” time to get beam-strike tests
  + Just cost shipping and/or travel
  + Salim – could be used in electron part of SPS as well
* Alex B – could we use injector?
  + Maybe. CLEAR gives us a range of 50-200 MeV, so we can get a scalable dosage and real beam strikes, instead of just environmental radiation
  + AB – there’s a 5 MeV dump that could be used parasitically
    - Ryan – yes, that’s worth checking out.

|  |  |  |
| --- | --- | --- |
| Action Items | Person responsible | Deadline |
|  |  |  |
|  |  |  |

## Special notes

Pathway to Repository: <https://jeffersonlab-my.sharepoint.com/:f:/g/personal/tristan_jlab_org/EqZ5MeS-nipCgPfZB5p0oS4B9Is67d3nQb9sLJI3Zyev9g>