FFA@CEBAF Working Group|Minutes

## Meeting date | time 02/02/2024 | 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 | Ryan |
| Timekeeper | Alex B |

 | AttendeesAlex B, Ryan, Scott, Edy, Kirsten, Stephen, Thomas, Randika, Andrei, Dejan, Vasiliy |

# Intro Discussion

* Ryan having severe computer issues
* Alex B – we have a green light to do FOA have a month to go
	+ Will be joint with BNL
	+ Thinking we may push for prototyping for PMs on BNL side
	+ Scott mentioned pushing design – so many outstanding things
* Pre-conceptual design due in 2 years.
* USPAS – Todd teaching, Alex Coxe is TA
* Donish is sick today, so discuss FOA

# Agenda topics

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

* Money comes October 1st
* $2M for two years
* Green light for us to submit from management
* Focus on joint proposal
* Dejan – there are 7 pages to be filled specifically for the grant. The 6 pages need to be done by JLab to make sure everything is correct
	+ Alex B – we’ll get some help. Looked at sheets, will have a hard time putting that info in
	+ Deadline is 2 months.
* Paperwork is changed
* Internal reviews necessary
* Alex B – will get help with people who handle this at JLab – will distill information
* Dejan – previous proposal we did missing a lot
* Ryan – last time, we focused on the money and thought about “what can we do?” This time, we need to define a project and then see what it costs.
* Alex B – let’s go through carefully
* Dejan – we need to add missing parts, etc…
	+ Let’s prepare this for next week.
* Alex B – we can start this week.
	+ Added proposal from 2 years ago into an FOA24 folder in the shared drive
* Everybody can add a little note into the folder
* Stephen – can you put in the official feedback you got last year. Did anyone tell you about it?
	+ Alex B – no technical comments saying things should be added/deleted
	+ Only showstopper was that the upgrade wasn’t on the books
* Dejan – we have to be careful with wording – cut and past the good stuff from the last one
* Stephen – Heard that the previous round of funding didn’t have as much as usual, and not many successful bids as two years ago. More of a rumor. May want to confirm
	+ Alex B – discuss with David Dean monthly
* Dejan – “like to provide pre-conceptual design report” as project deliverable
	+ Alex B – “work on complete concept of upgrade”
		- May or may not go to pre-CDR
		- Scott – that’s too ambitious – don’t oversell
* Scott – If I look at this project as it stands, I’d want to see (after two years) – a particle/linear map pushed through end-to-end with realistic (vaguely believable) magnets?
	+ Dejan/Scott magnet discuss
	+ Don’t need engineered design, but they have to be reasonable
	+ Dejan – but have all the maps done in 2 years
* Alex B – that’s a well-defined task
* Scott – not small
	+ Need staff (postdocs)
	+ 2-3 people working full time for the two years
	+ This should be most of the people
* This is a hard task – need full time people on it
* Ryan tries to describe how much 3 postdocs will cost, but is spoken over
* Scott – mearly talking about getting particles around front to end
* Scott continues Ryan’s math:
	+ 70K x 3 people plus overhead (x2) rounds to half a million, so $1M in two years – that’s half the money. Let’s be realistic
* Scott – be careful about the language of conceptual/pre-conceptual design
	+ Let’s think of 2 years: what do you got for us?
		- Let’s make them nod and continue on
* Dejan – this project will have provided funding only if goals are connected to physics. We need someone from physics to be involved to give needs, etc…
* Alex B – we have a JLAAC recommendation to get minimum requirements from physics
* Ryan – we have splitters, extraction, transition, LERF2NL line, and hall lines
	+ Alex B – we looked at a first go at Hall lines, but have to worry about dispersion and beam size
	+ Ryan – the Hall Lines need to make sure we can fit the beam with Halo
* Extraction – Reza has idea, but they need to be simulated
* Discussing 3 FTEs for FOA
* Need overhead/PM for this as well
* For this initial discussion – we need to focus on Scott’s idea – get everything mapped out for whole system
* Dejan - Need to have a person responsible for someone putting it all together with good software skills
	+ Alex B – currently have Github repository
		- Started talking with Donish about this
* Ryan – are we going to extend Donish? He’s done in October
	+ Yes – there’s a plan to transition him to stay, I’ve talked to him about this. There’s a plan to internally transition him
* Stephen - Andrei was asking about a full-length magnet development. Will this be in the FOA?
	+ Ryan – SBIRs available for maybe getting the hardware done with small businesses – might be more appropriate
		- Alex B – Ryan’s right, that might be great. Spoke with Michelle Shin
	+ Dejan – comment by Stephen is good. Gave info about companies that can make these cells.
* Alex B – could do this then put it into BSY dump as a test line
	+ Jay, Ryan, and Kirsten looked into that
* Dejan – at CBETA, they didn’t like Stephen’s solution for PMs. Strong disagreement about how to build the magnets.
	+ Until Stephen built 12 Halbachs, and had a big review, defended Halbach vs iron
		- Small problems with iron and crosstalk
		- All arguments eventually supported Stephen, only after he showed he can correct the fields
		- Every magnet was better than iron – that’s how it worked out
	+ Stephen – we’ve gone further now – next would be a long magnet for CEBAF. So how make full size? Go with industry anyway.
* Side talk about magnets – JLAAC reviewer Timur spoke about hybrid magnets. We could invite him to talk about this.
* Donish will look at error analysis and misalignments in splitters
* Alex B – I propose for the next meeting that we need to develop the concept. Put field maps for different parts of the accelerator system. Stay away from pre-conceptual, but this will be the cornerstone
	+ Could you lead the discussion next week, Scott? This way we can go into the sub-bullets of the proposal
	+ Scott – I can be part of it, but I can’t organize it alone. While I’m the first to say we need to get the lattice design done, but I think the proposal will have parts beyond that, and somebody else needs to be the person that decides that. Have to figure out what else we want to do
		- I want some of that to come from Stephen (to pick on the one person that doesn’t fit into my game plan that well) – it’ll be good to make sure his inputs are considered
	+ Stephen – not sure if there will be a hardware portion or not.
		- Will it just be the design? Will it be hardware?
		- Alex B – maybe do this with SBIR
	+ Scott – I don’t have a grip on all of the parts. If anyone, Ryan does.
	+ Alex B – Stephen has made a very significant contribution last time for magnet R&D
		- Have to decide if you are going to have any hardware in this FOA, or just design
	+ In terms of parameters, we can make magnets for the FFA parts with simulation and maybe correction, etc…
* Scott – secret goal: what I want to make sure of is that Stephen is engaged and essentially the proposal is written in such a way that Stephen keeps his involvement in the process. Don’t want to see something happen where Stephen goes and finds something else interesting to do
	+ My concern – in terms of lattice design process, my gut feeling is (in two years) on day 1 we treat the arc cell as an input. That’s a fixed point for the 2 year process
		- Stephen – won’t have a huge propogation to rest of machine
		- Scott – don’t want or need annoyance of changing pieces. It’s ok for it to change, but in terms of design of the rest of the lattice, we need the arc cell to be a fixed point.
		- Stephen – it’s basically a table – we can try to keep that as the basis, and move it as needed
* Scott – what are the goals in regards to the FFA magnet lattice, in particular, since it’s clear that even if we optimize, it won’t have a huge impact on the rest of the design?
	+ Further optimizing/looking at radiation issues?
	+ Stephen – can go in several directions – we were lacking in energy range. So added sextupoles, and now we need to add dynamic aperture studies.
	+ Need more correction studies
		- Alex B – yes, this needs to be included. There’s an angle that we need to make sure we know what BPMs, how many, locations, etc…
			* We’re currently upgrading our BPMs now – so we need to include our needs in the upgraded system
* Stephen – Alex Coxe was really putting out good stuff these days, not sure he’s staying
	+ Ryan – he’ll be done by August
* Alex B – Salim will come by April, and will start taking part before he arrives
* Dejan – going through the elements that need to be build – 1988 was the time he did some similar work
	+ This is what David Douglas took over and made the spreaders
* Alex B – so, next week: should I ask Stephen/Scott to organize the discussion?
	+ Scott – picking on Ryan to be part
		- To me, the whole thing is we have lots of parts, splitters, and all this other stuff, and Ryan knows what all the other stuff is
	+ Stephen – configuration control
* Scott – keeps everything on GitHub
* Scott – multipass correction through machine is also crucial
	+ Good to add this in – Stephen could help
* AB asked Donish to pick up things like Dynamic Aperture
	+ Scott – let’s keep that out. Keep it more focused

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| Action Items | Person responsible | Deadline |
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## Time allotted | 25 mins | Agenda topic Alternative Splitters | Presenter Donish

* Next time
* Before we switch to 5 pass baseline, need to make sure our sextupole option will work

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| Action Items | Person responsible | Deadline |
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## Time allotted | 10 mins | Agenda topic AOB | Presenter All

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

Pathway to Repository: [https://jeffersonlab-my.sharepoint.com/:f:/g/personal/tristan\_jlab\_org/EqZ5MeS-nipCgPfZB5p0oS4B9Is67d3nQb9sLJI3Zyev9g](https://jeffersonlab-my.sharepoint.com/%3Af%3A/g/personal/tristan_jlab_org/EqZ5MeS-nipCgPfZB5p0oS4B9Is67d3nQb9sLJI3Zyev9g)