

Proposed replacement FFA baseline
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After attending the J-Future workshop and learning that 18-20 GeV would suffice for all but the highest x physics (just one talk) I propose that the FFA baseline that is being pursued be replaced by:

- Injection 650 MeV
- Four electromagnetic passes at 1200 MeV/linac (10.21 GeV exit)
- One FFA to ~ 19.3 GeV.

Permanent magnets to have two apertures, one for electrons and one for positrons, to make it possible to switch within a day or less. Arcs 3-10 would be moved up one level to make the first four passes, needed due to higher injector energy. New stands needed. Permanent magnet pass five could be supported off the floor or on stands. Only one level of horizontal TOF compensators needed.

Two presently non-existent technologies are needed to make the higher energy work in the existing tunnel: conductively cooled SC RF separators and conductively cooled HTS septum magnets. JLab SRF is submitting the first to the NP FOA. BNL is likely submitting the second.

Hall D is interested in beam, contrary to the energy limits conveyed to me two decades ago by Curtis Meyer. Doug Higinbotham and I had an email exchange about how one might do that if only three halls got beam simultaneously. He asked if the Hall A beam could be swung around in a new, long transfer line. This led me to think about the 4 GeV BSY in which the vertical separators for ABC were very early in the extraction region. If we had much stronger thin septa the C beam could either be pushed down far enough to be bent into the arc to go around to Hall D or proceed as it used to to Hall C. C beam because it's the lowest. Can the FFA could accommodate this or is a dedicated arc needed? 499 MHz for all beams, so less space charge effect in the injector.

J-Future summary session envisaged a staged scenario:

1. incremental detector upgrades with modest cost, similar to RHIC's old strategy
2. positron source, chopped, in a vault big enough to later encompass either a second positron source to allow both unpolarized and polarized delivery or the 540 MeV two-pass ring needed to get injection energy up for
3. FFA-based energy "doubling"

Most of the participants were associated with Halls B and D. Hall A assumes SoLID for the 2030s. Hall C has a separate Hall C Futures working group of which I am a part.