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An extraction scheme for future CEBAF FFA based energy upgrade

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Jefferson lab is considering an energy increase from current 12 GeV to 22 GeV for its CEBAF accelerator. This will be accomplished by recirculating 5-6 additional turns through two parallel CEBAF LINACs using an FFA arc at each end of the racetrack. The total recirculation turns would be 10 times, the first four turns use present conventional arcs to make the 180-degree bends from one LINAC to the other. However, the last 5-6 turns will all share a single beam line inside two FFA arcs. This reduces the footprint and the cost of the project significantly. On the other hand, having the trajectories of last 5-6 recirculating beams close to each other makes it challenging to extract beams from different passes with different energies. In this paper we will explain our present extraction system for 12 GeV, our challenges and limitations, and a possible extraction solution for the 22 GeV upgrade with the goal of extracting beam at different turns/energies to different experimental halls.

Footnotes

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