The present Linac Baseline Design has a final energy of 842 MeV. We are presently working with a "Modified Baseline" design, having a better phase law, that delivers a 849 MeV beam. The design parameters for the SRF Modified Baseline are summarized graphically shown in Figure 1.

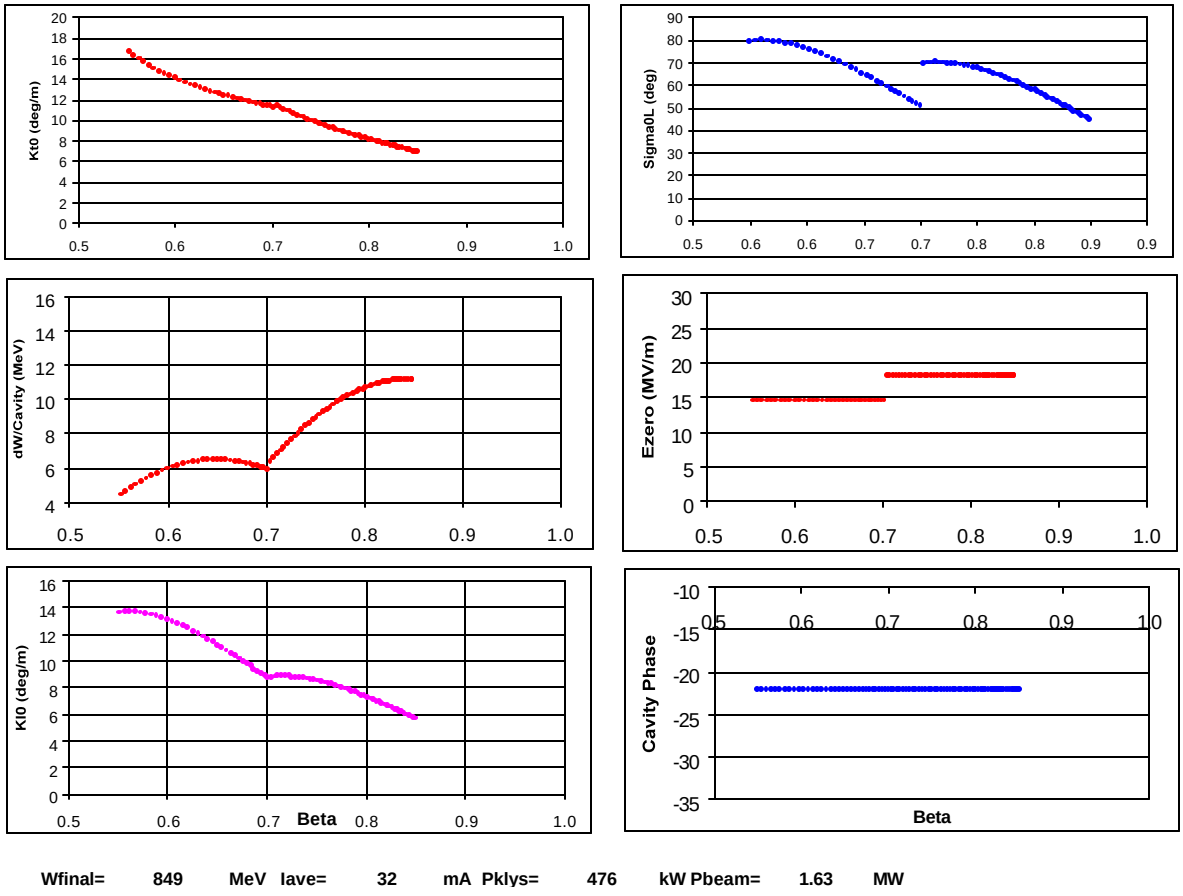


Figure 1

In this design we assume that all cavities will operate with an E_{max}=27.5±10%. To take advantage of the fields available in the best cavity the maximum beam current will be limited to 32 mA. The expected beam power is 1.63 MW.

We have investigated a number of candidate design that take advantage of the potential for improved cavity fields predicted by Jefferson Lab. We assume average values of E_{peak}=27.5 & 35.0 MV/m respectively in the low- and high-beta sections of the SRF linac. Random values are then applied to evaluate the performance of realistic cavity distributions. Figure 1 shows the expected distribution of E_{peak} in the low and high beta sections suggested by Ron Sundelin.

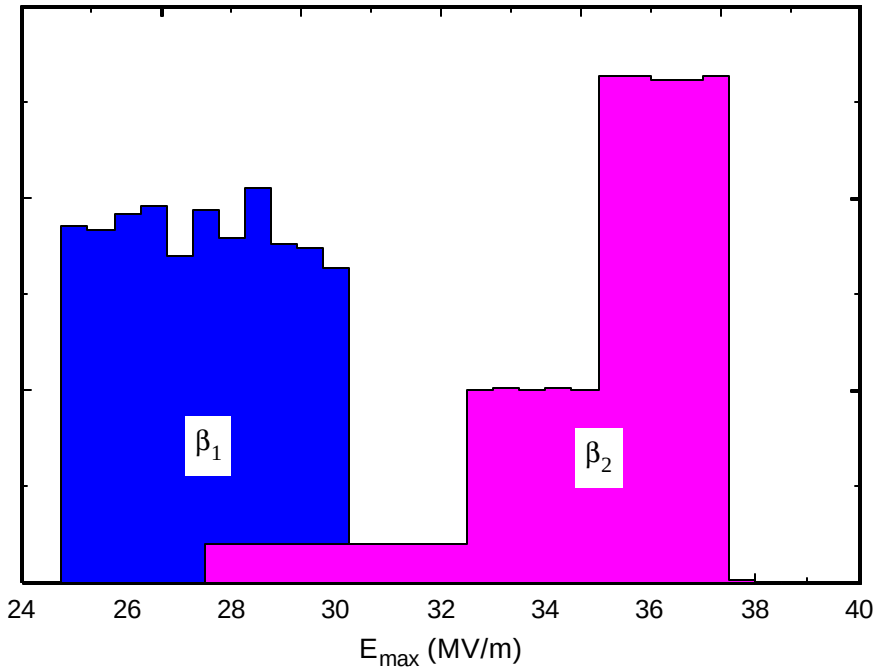
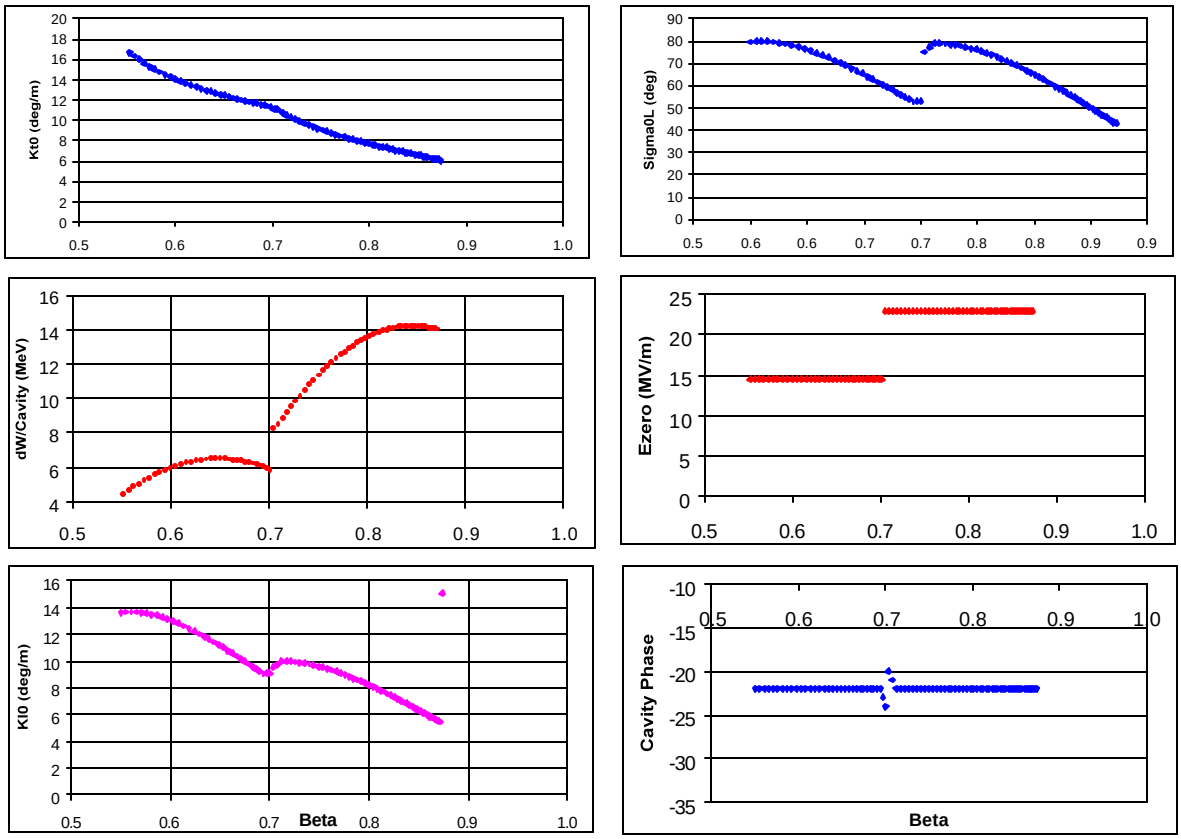


Figure 2

If we now assume that the expected cavity fields will be represented by this distribution, and there is no change in the linac topology, we would have to tune the phases slightly at the transition to assure a smooth longitudinal match. The higher cavity fields in the high β cavities will increase the final energy to 993 MeV, an expected improvement of 144 MeV. The details of the "Modified Baseline" operated at higher fields is summarized in Figure 3.

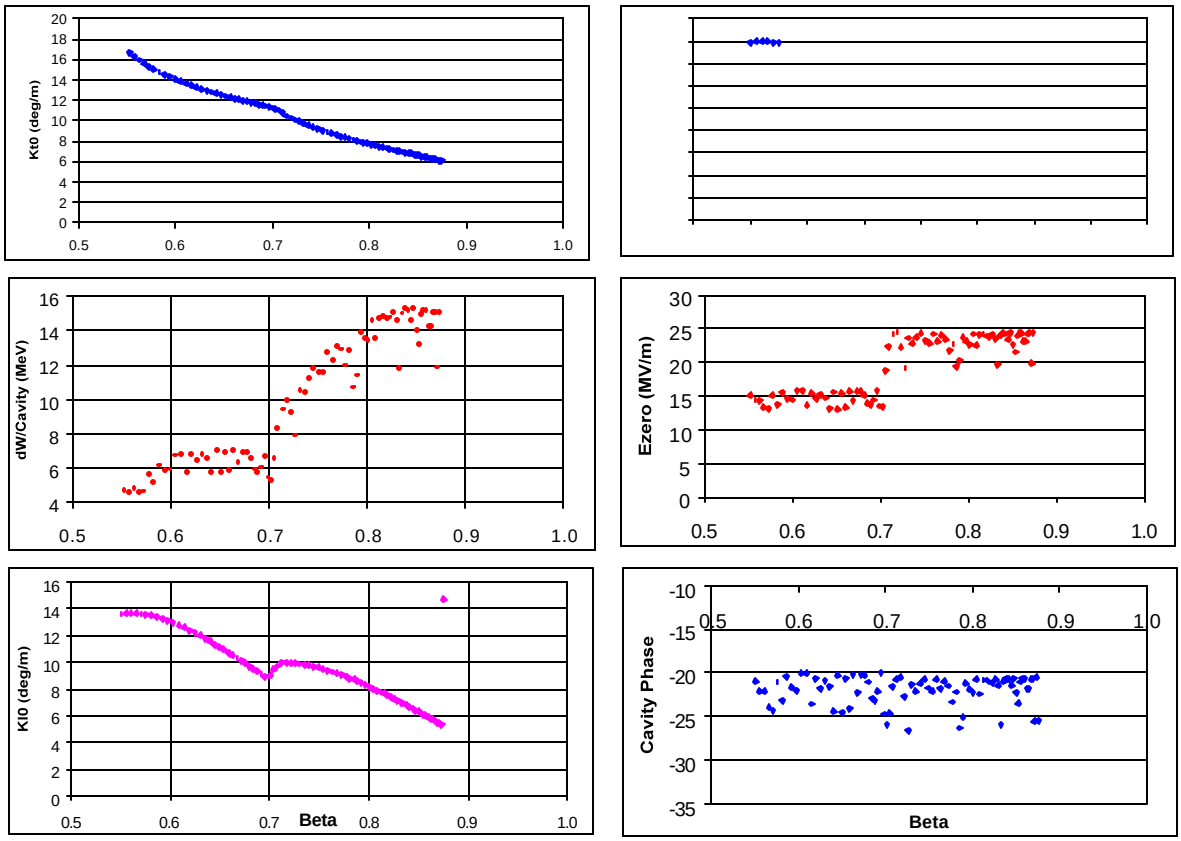
We expect the best cavities to have an accelerating field about 36% higher than the baseline design. However, because the rf power available to each cavity is limited, the beam current must be reduced about 25% to take advantage of the fields in the best cavities. Consequently the average macropulse beam current will be limited to about 27 mA. The total expected beam power will be reduced slightly to 1.61 MW.

Figure 4 shows a scenario in which the linac is comprised of a set of cavities randomly selected from the above distribution. In this case we expect the linac to deliver a 1 GeV beam and use all but 2 watts from at least one of the klystrons.



Wfinal= 993 MeV Iave= 27 mA Pklys= 510 kW Pbeam= 1.61 MW

Figure 3



Wfinal= 1001 MeV Iave= 27 mA Pklys= 548 kW Pbeam= 1.62 MW

Figure 4