

GTF Triplet Optics

R.Iverson, P.Bolton, J.Clendenin, S.Gierman, M.Hernandez, J.Schmerge

SLAC

A study of the GTF optics was performed to further optimize the beam line for future experiments. One requirement is to generate a round beam profile over a half-meter test section. Since the beam emittance is essentially equal in x and y, equal betas are needed to maintain a round beam. To achieve this, a quadrupole triplet is used. The output of a dimad based model calculation of the optimized beam line is shown in Figure 1. The upper plot shows the twiss parameters beta x and y for the present quad doublet GTF optics. The lower plot shows a quad triplet solution, which sets beta x and y to be as equal as can be achieved given the input conditions. In the triplet solution, the current is -1.9 amps in Q1, 3.88 amps in Q2, and -1.9 amps in Q3. The distance between the upstream face of each quad is 0.123 m. This allows the three quads to use the entire length of the existing 0.324 -m support rail with equal drift length between each quad.

