

1.1 HEBT

The High Energy Beam Transport (HEBT) matches beam transversely from the linac to Booster injection, minimizes the energy spread at the injection, provides ion charge state discrimination, and provides space for diagnostics. The preinjector is located in the lower equipment bay of the 200 MeV H^- linac. In order to provide the necessary space for power supplies and water cooling, a 2-story extension will be added onto the building, providing an additional 2800 ft² of floor space. A beamline penetration through the linac shielding provides a short, direct path into the Booster allowing injection using the existing heavy ion inflector. The line is shown schematically in Figure 3.6.1. Since the RFQ and linac will not eliminate all unwanted charge states, the line will be designed for charge discrimination. A debuncher cavity will be used in HEBT to rotate the longitudinal phase space to minimize the energy spread at Booster injection. Table 3.6.1 gives the Twiss parameters at the end of the linac and entrance of the booster.

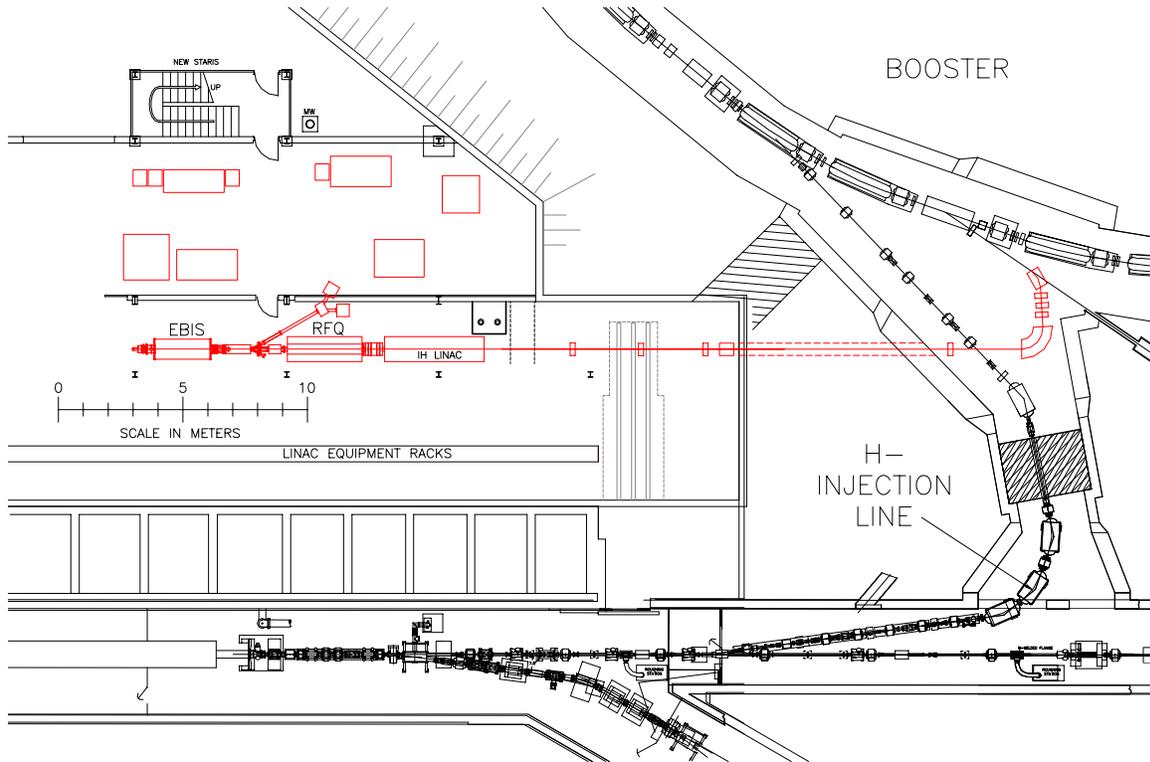


Figure 3.6.1 Schematic showing the preinjector in the lower equipment bay of the 200 MeV Linac.

Table 3.6.1: Twiss parameters at end of IH Linac entrance of the Booster

Parameters	End of IH Linac	Entrance to Booster	Units
Alpha_x	1.2000	-1.7277	
Beta_x	2.1736	11.008	mm/mrad
Emittance (5*rms, unnorm)	9.2	9.21	pi mm mrad
Alpha_y	0.28.00	0.82163	
Beta_y	1.4397	4.8321	mm/mrad
Emittance (5*rms,unnorm)	9.2	9.2	pi mmrad
Energy spread (for 5 rms emittance)	+180	+170	keV

