1 Injection parameters

Table 1: Realistic laser parameters

Laser wavelength	780 nm
Laser power	379 TW
Spot size	$3.8 \times 10^{-9}\,\mathrm{m}^2$
Intensity	$9.9 \times 10^{18}\,\mathrm{W/cm}^2$
a_0	2.1
Laser pulse length (FWHM)	50 fs
Reprate	$\sim$1 Hz
Pulse Energy	20 J

Table 2: Plasma parameters

Critical density	$\sim 1.5 \times 10^{21}\,\mathrm{cm}^{-}3$
Plasma density	$1.75 \times 10^{17}\,\mathrm{cm}^{-}3$
Plasma wavelength	76 µm
Plasma frequency	3.97×10^{12} Hz
Plasma angular frequency	$2.49 \times 10^{13}\,\mathrm{s}^{-}1$
Accelerating gradient	0.42 GeV/cm
Bubble size	38 µm
Depletion length	16.9 cm
Dephasing length	33.5 cm
Acceleration length for 1 GeV	2.4 cm
Acceleration length for 3 GeV	7.2 cm