Luminosity Upgrade Parameters

	e-beam	p-beam
energy	$30\ GeV$	$820\ GeV$
bunch charge N	$4.18 \cdot 10^{10}$	$10 \cdot 10^{10}$
Beam Current	$58\ mA$	$140\ mA$
normalized emittance ε_N	$2.44 \cdot 10^{-11}\ mGeV^{-2}$	$5\pi\ \mu m\ rad$
horizontal emittance	$22.\ nm\ rad$ †	$5.72\ nm\ rad$
emittance ratio	0.18	1
horizontal β at IP β_x^*	$0.63\ m$	$2.45\ m$
vertical β at IP β_y^*	$0.26\ m$	$0.18\ m$
beam size $\sigma_x \times \sigma_y$	$118\mu m \times 32\mu m$	$118\mu m \times 32\mu m$
beam-beam tune shift/IP $\Delta\nu_{x,y}$	.03, .04	.002, .0004
number of colliding bunches	174	
luminosity	$7.6 \cdot 10^{31}\ cm^{-2}s^{-1}$	
specific luminosity	$1.7 \cdot 10^{30}\ cm^{-2}s^{-1}mA^{-2}$	
increase factor	3.8 ‡	

† Assumes ≈ 90/60° arc phase advance.

‡ Relative to 1995 specific luminosity.