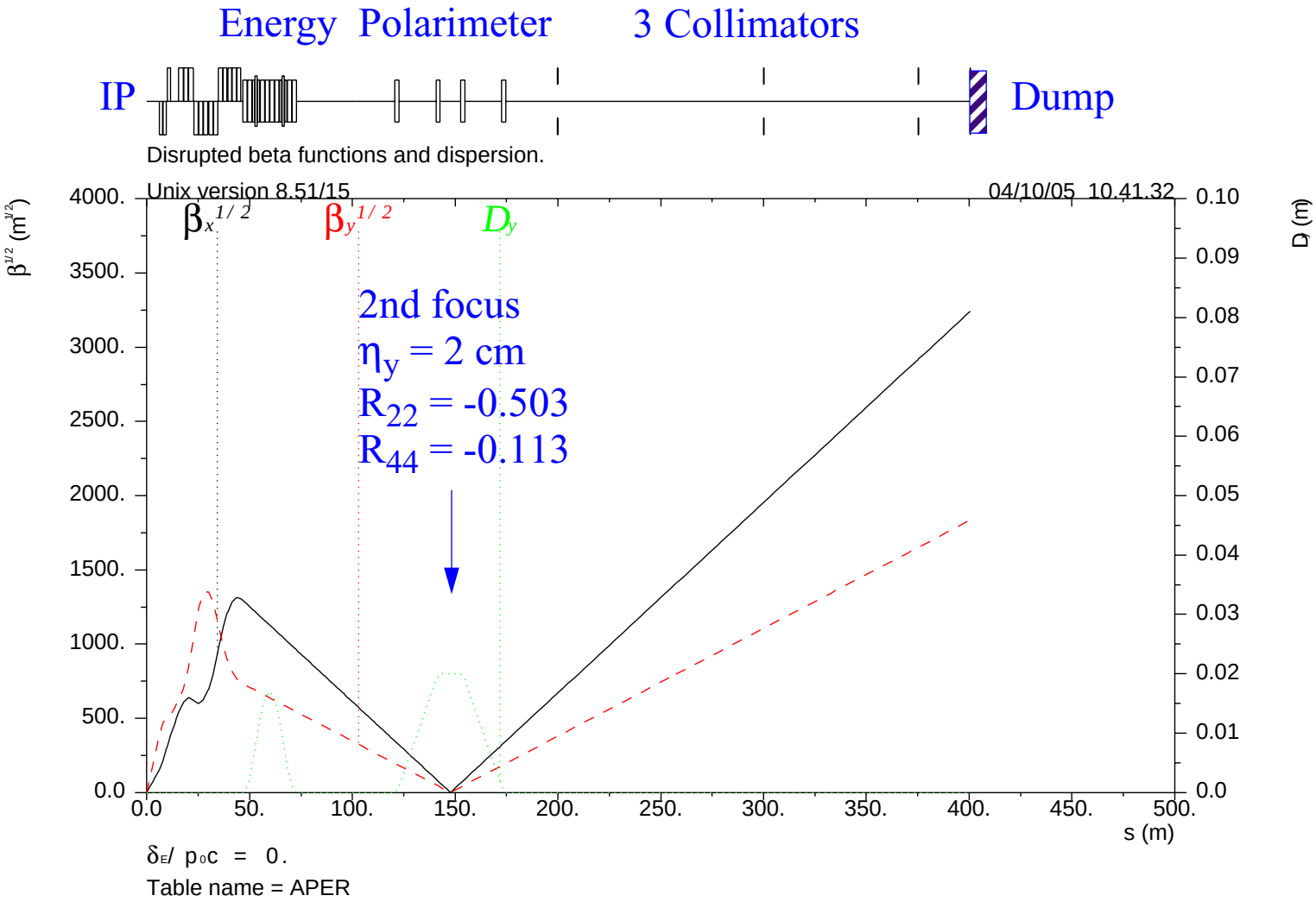
Extraction Line Optics for 14-20 mrad Crossing Angle

Modifications:

- 6 m distance from IP to the first extraction quadrupole.
- 4 m gap for crab-cavity.
- Two options for photon aperture based on maximum photon IP angle: 1.25 mrad and 0.75 mrad.

Beam optics


Energy Polarimeter
3 Collimators
IP
Dump
Disrupted beta functions and dispersion.
Unix version 8.51/15
04/10/05 10.41.32
$\beta_x^{1/2}$
$\beta_y^{1/2}$
D_y
2nd focus
η_y = 2 cm
R_{22} = -0.503
R_{44} = -0.113
$\beta^{1/2}$ (m$^{1/2}$)
D (m)
s (m)
$\delta_E / p_0 c$ = 0.
Table name = APER

Magnet parameters at 1 TeV CM

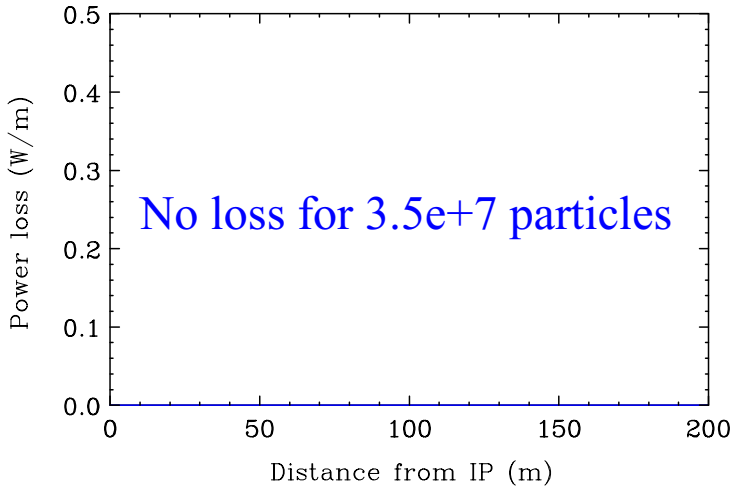
Quad	L (m)	G (T/m)	B (T) at aperture	R (mm)
QDEX1A SC	1.6407	-83.333	-1.5	18
QDEX1B SC	1.6407	-50.000	-1.2	24
QFEX2A SC	1.6187	40.000	1.2	30
QFEX2B,C,D	2.1431	23.809	1.0	42
QDEX3A,B	2.1058	-23.809	-1.0	42
QDEX3C	2.1058	-21.739	-1.0	46
QDEX3D	2.1058	-19.231	-1.0	52
QDEX3E	2.1058	-16.129	-1.0	62
QFEX4A	1.9448	14.084	1.0	71
QFEX4B,C,D,E	1.9448	11.765	1.0	85

- Chicane bends are L = 2 m long with B = 0.8339 T field at 1 TeV CM.
- R is the inner beam pipe radius.

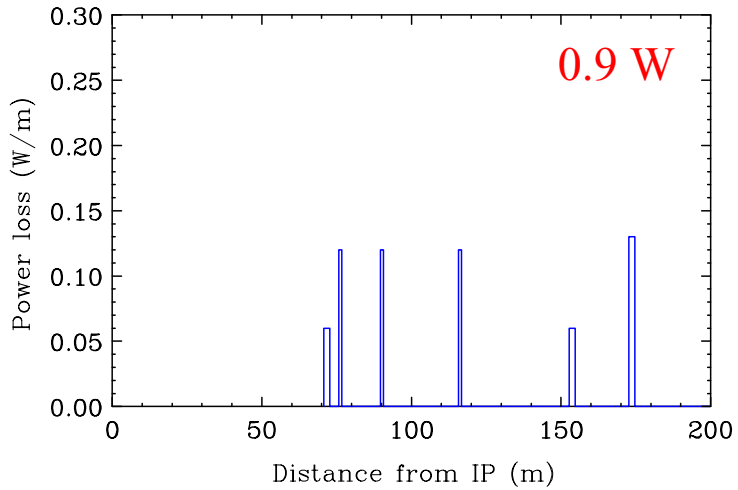
Density of disrupted beam loss (W/m) (before collimators)

Aperture for 0.75 mrad IP photon angle

0.5 TeV CM nominal, Δy = 0

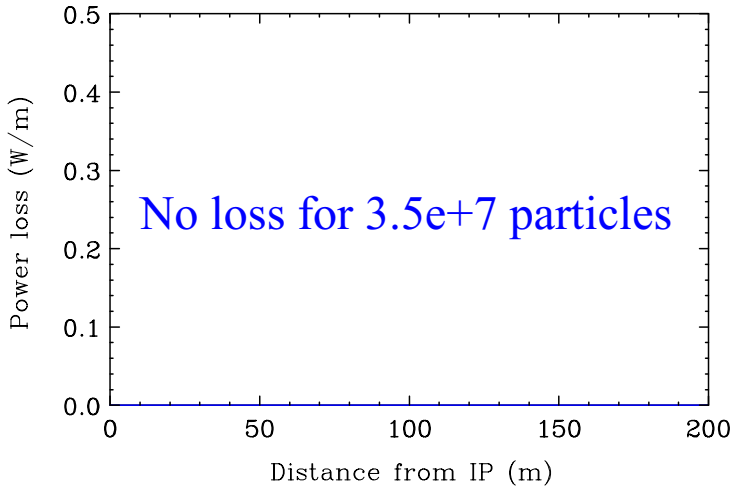


0.5 TeV CM nominal, Δy = 200 nm

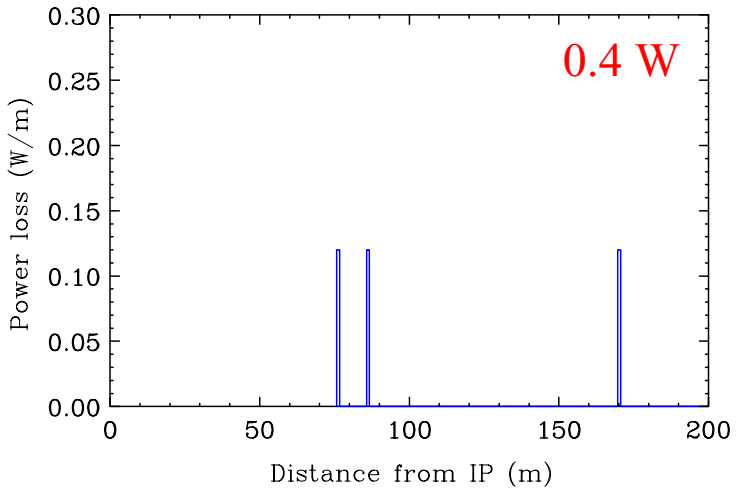


Aperture for 1.25 mrad IP photon angle

0.5 TeV CM nominal, Δy = 0



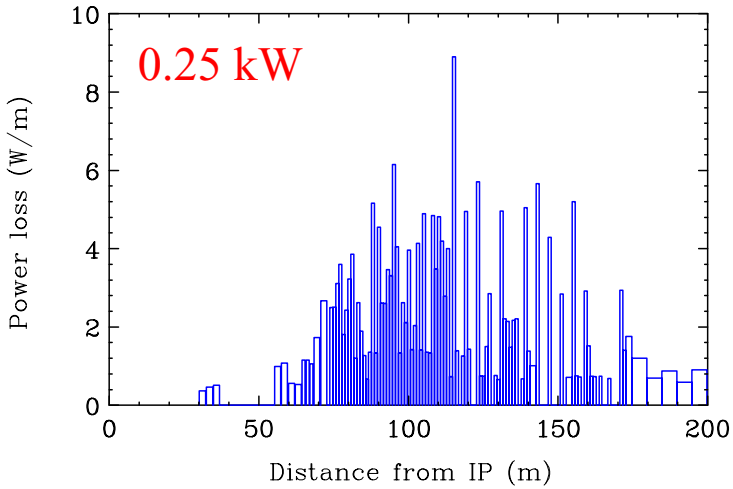
0.5 TeV CM nominal, Δy = 200 nm



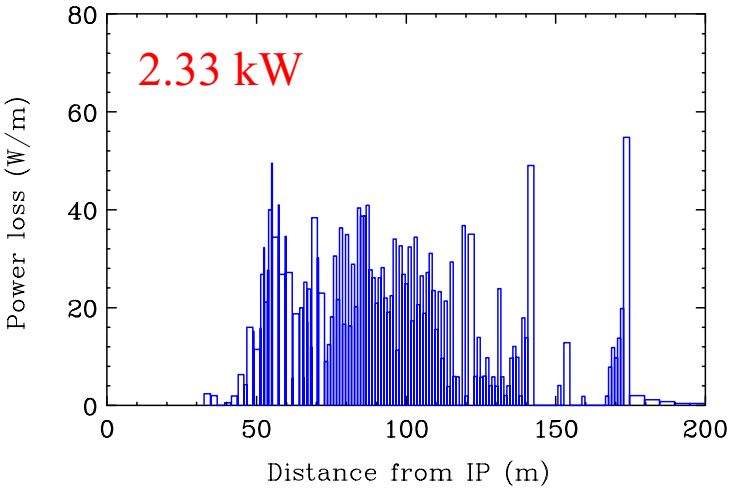
Density of disrupted beam loss (cont'd)

Aperture for 0.75 mrad IP photon angle

1 TeV CM nominal, Δy = 0

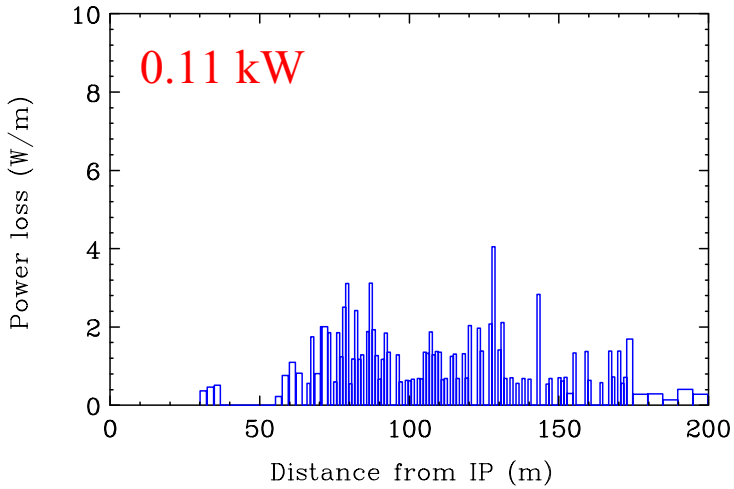


1 TeV CM nominal, Δy = 100 nm

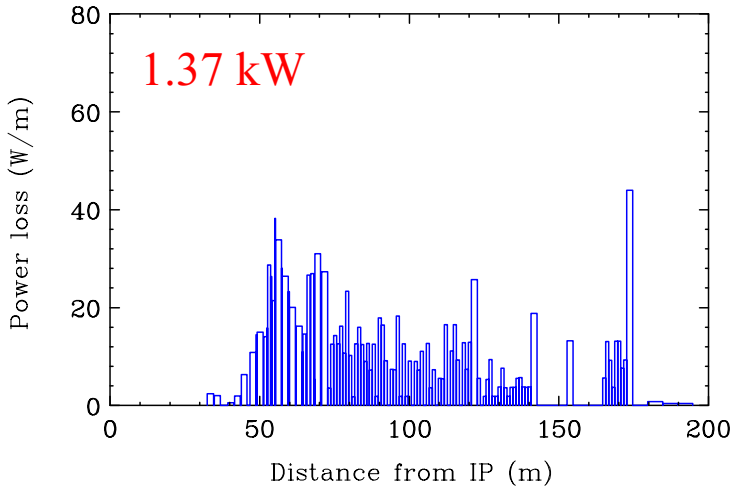


Aperture for 1.25 mrad IP photon angle

1 TeV CM nominal, Δy = 0



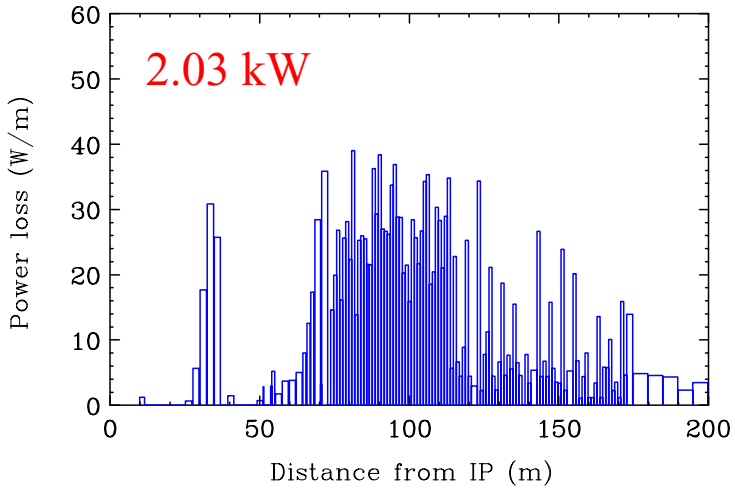
1 TeV CM nominal, Δy = 100 nm



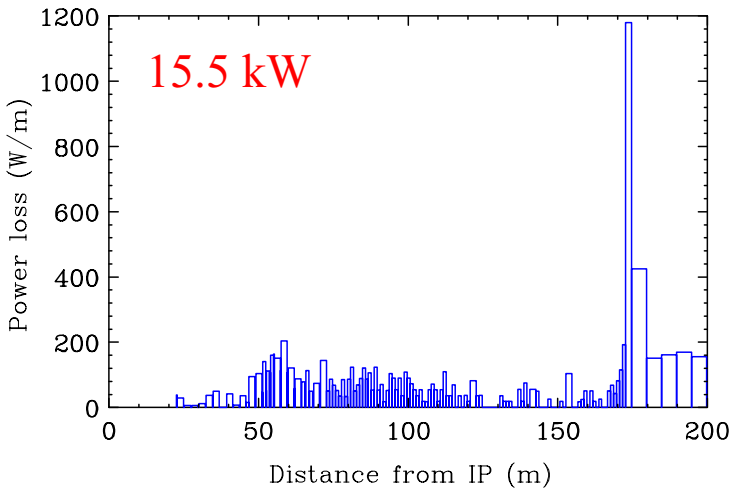
Density of disrupted beam loss (cont'd)

Aperture for 0.75 mrad IP photon angle

0.5 TeV CM high-L, Δy = 0

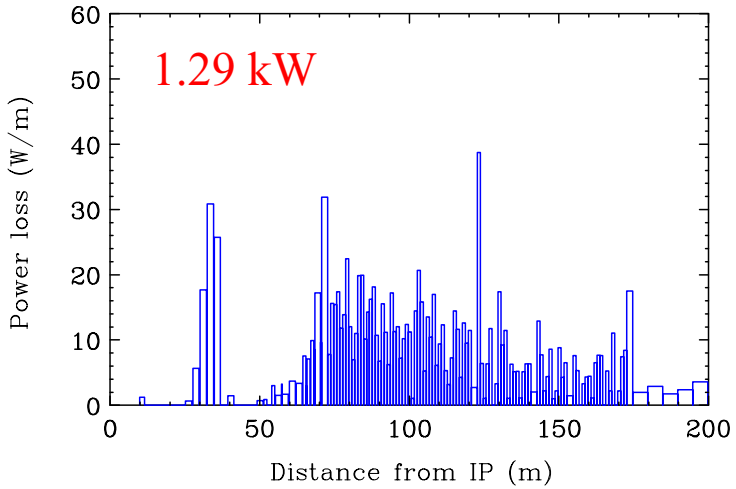
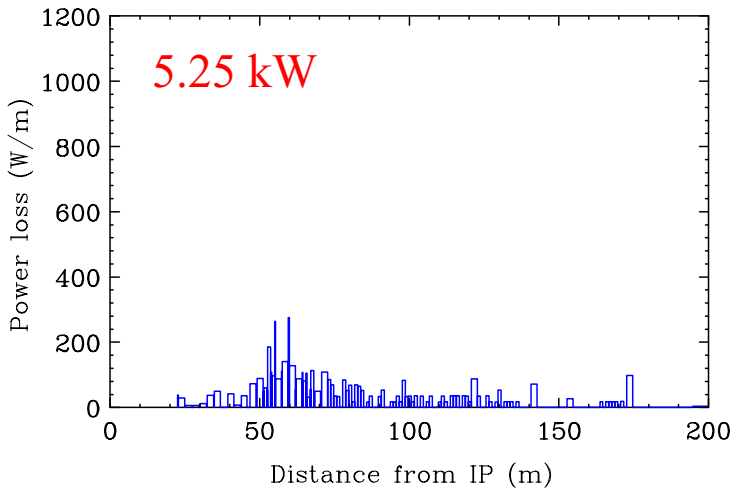


0.5 TeV CM high-L, Δy = 120 nm



Aperture for 1.25 mrad IP photon angle

0.5 TeV CM high-L, Δy = 0



0.5 TeV CM high-L, Δy = 120 nm