GLC Dump Line Design
for
Measurement of Energy Distribution
K.Kubo (KEK)
Dump Line Optics (Crossing angle 7 mrad)
Dump Line Geometry (Crossing angle 7 mrad)

opposite beam

Beamstrahlung

Horizontal (m)

Vertical (m)
Optics from IP to 2nd focus.

Vertical dispersion = 40 mm
x-y distribution at 2nd focus for monochromatic beams.
Horizontal laser wire can be used for energy distribution measurement.

\[ \Delta\frac{E}{E} = -0.2\% \]
\[ \Delta\frac{E}{E} = -0.4\% \]
\[ \Delta\frac{E}{E} = -0.6\% \]
\[ \Delta\frac{E}{E} = -0.8\% \]
\[ \Delta\frac{E}{E} = -1\% \]
\[ \Delta\frac{E}{E} = 0 \]
x-y distribution at 2nd focus.
Simulated by CAIN(collision) and SAD(beam line).
Number of $\gamma$-rays/bunch-crossing vs. laser wire position
(rough estimation, Preliminary)
Assumption:
- Laser peak power = 10 MW (0.1mJ, 10 ps)
- Laser wire size: $\sigma = 10 \, \mu m$ ($\Rightarrow \Delta E/E \, 0.025\%$)
- Bunch population: $N = 7E9/bunch$

![Graph showing the relationship between the number of $\gamma$-rays/bunch-crossing and laser wire position.](image-url)