Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1.001$
Waist 0.18 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1.0008$
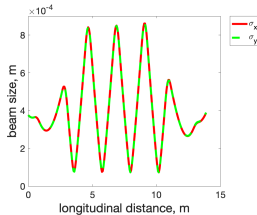
CeC Physics

Jun Ma

Collider-Accelerator Department
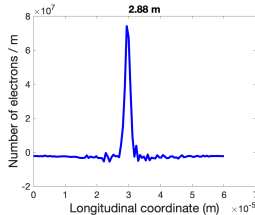Brookhaven National Laboratory

9/31/2021

Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1.001$
Waist 0.18 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1.0008$

- Peak current 50 A, KV emittance 6 μm
- Modulator 2.88 m
- The single ion with reference energy is located at z=3e-5 m in the plots.
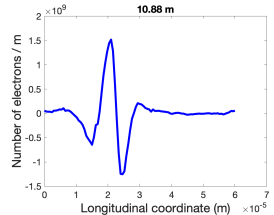- Beam waist 0.15 / 0.18 / 0.12 mm

(a) Beam size (b) Exit of modulator (c) Entrance of kicker

Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1.001$
Waist 0.18 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1$
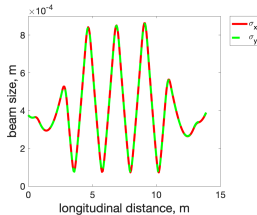Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1.0008$

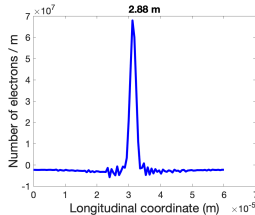(a) Energy kick, 2D   (b) Energy kick, 1D
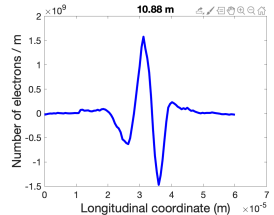
(c) Density, 2D   (d) Density, 1D

Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1.001$
Waist 0.18 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1$
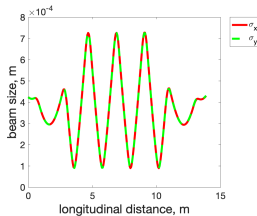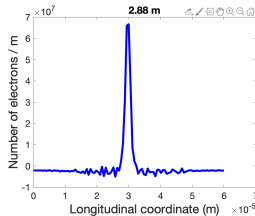Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1.0008$

(a) Beam size

(b) Exit of modulator

(c) Entrance of kicker

(a) Energy kick, 2D   (b) Energy kick, 1D

(c) Density, 2D   (d) Density, 1D
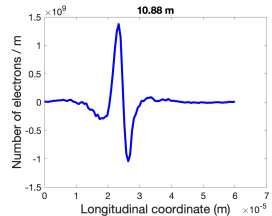
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1.001$
Waist 0.18 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1.0008$

(a) Beam size

(b) Exit of modulator

(c) Entrance of kicker

Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1.001$
Waist 0.18 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1$
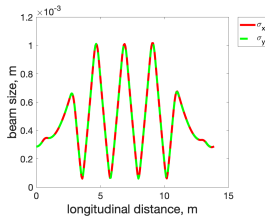Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1.0008$
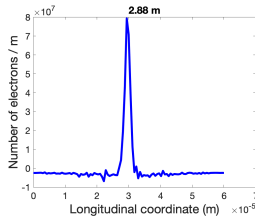
(a) Energy kick, 2D   (b) Energy kick, 1D
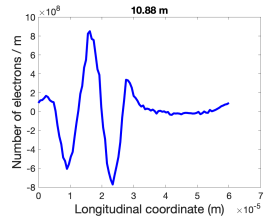
(c) Density, 2D   (d) Density, 1D

(a) Beam size   (b) Exit of modulator   (c) Entrance of kicker

(a) Energy kick, 2D   (b) Energy kick, 1D

(c) Density, 2D   (d) Density, 1D

Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1.001$
Waist 0.18 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1$
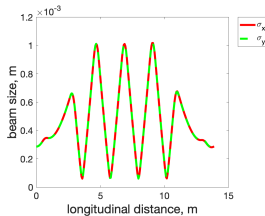**Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1.0008$**

(a) Beam size   (b) Exit of modulator   (c) Entrance of kicker

Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1$
Waist 0.15 mm, $\gamma_{electron}/\gamma_{ion} = 1.001$
Waist 0.18 mm, $\gamma_{electron}/\gamma_{ion} = 1$
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Waist 0.12 mm, $\gamma_{electron}/\gamma_{ion} = 1.0008$

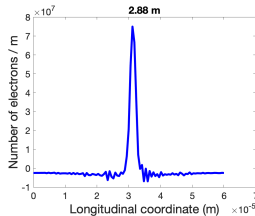(a) Energy kick, 2D   (b) Energy kick, 1D
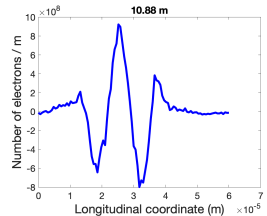
(c) Density, 2D   (d) Density, 1D