

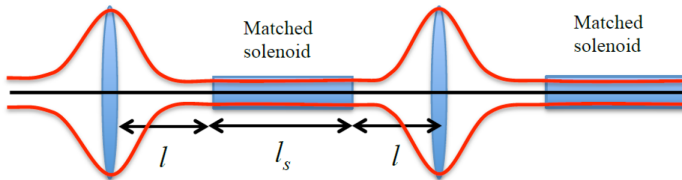
CeC Physics

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6/25/2021

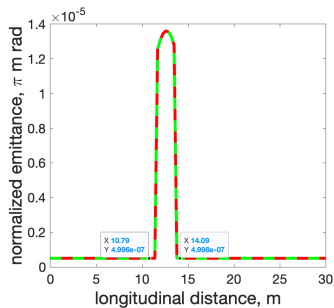
PCA for EIC



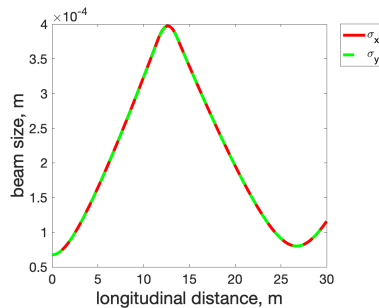
(a)

- KV distribution
- Energy $\gamma=293.1$, R.M.S. energy spread $\delta E/E=1\text{e-}4$
- Peak current $I=150 \text{ A}$
- Normalized KV emittance $\varepsilon_{n,KV}=2, 5, 10, 20 \mu\text{m}$
- Beam waist $a_o=1.35\text{e-}4 \text{ m}$
- Cell length 30 m, central solenoid length $l_s=4.8 \text{ m}$, $l=12.6 \text{ m}$
- Solenoid radius 0.01, 0.1, 1 m

$$\varepsilon_{n,KV}=2 \mu\text{m}$$

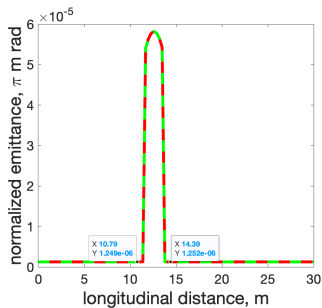


(a)

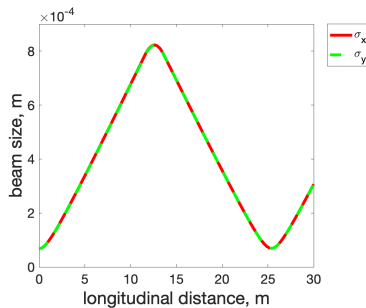


(b)

$$\varepsilon_{n,KV}=5 \mu\text{m}$$

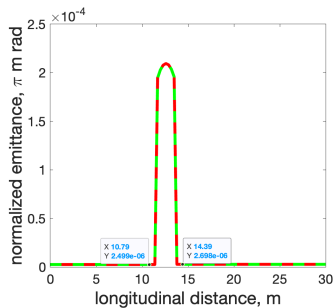


(a)

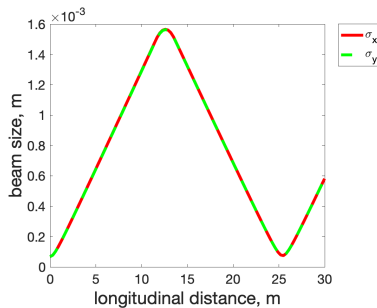


(b)

$$\varepsilon_{n,KV}=10 \mu\text{m}$$

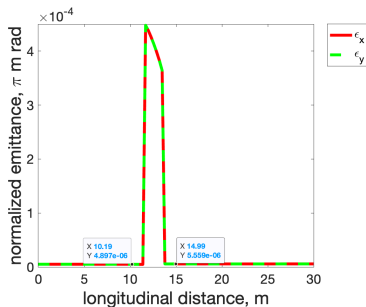


(a)

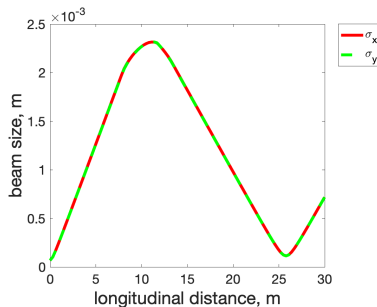


(b)

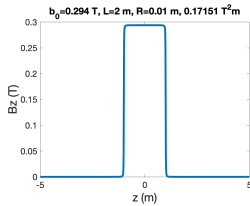
$\varepsilon_{n,KV}=20 \mu\text{m}$, particle loss



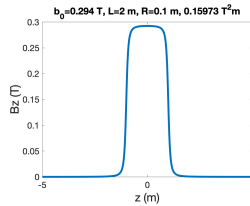
(a)



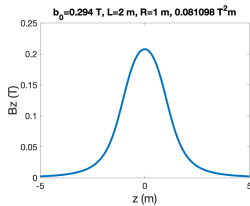
(b)



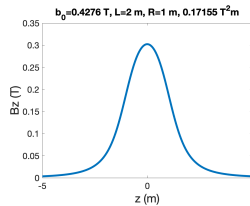
(a) Solenoid r 0.01 m



(b) Solenoid r 0.1 m

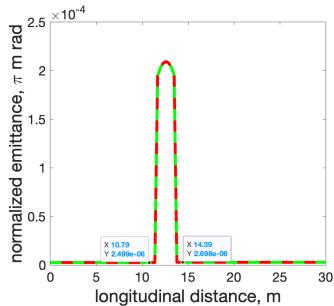


(c) Solenoid r 1 m, weak focusing

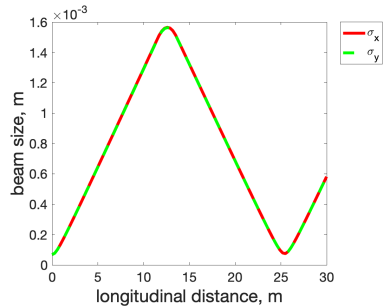


(d) Solenoid r 1 m

Solenoid radius 0.01 m

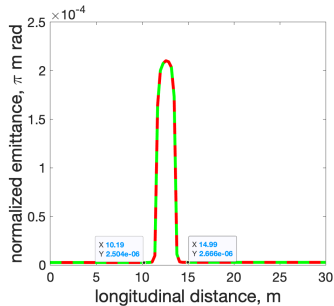


(a)

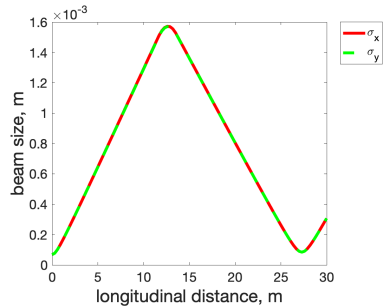


(b)

Solenoid radius 0.1 m

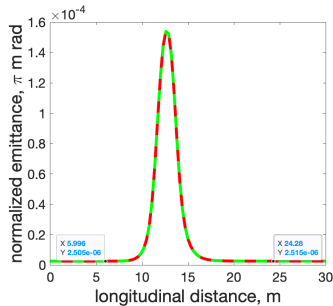


(a)

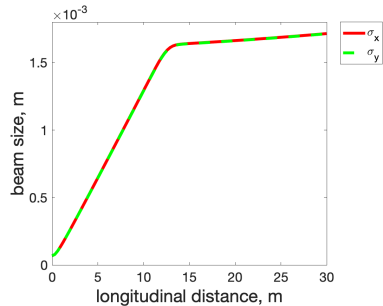


(b)

Solenoid radius 1 m, weak focusing

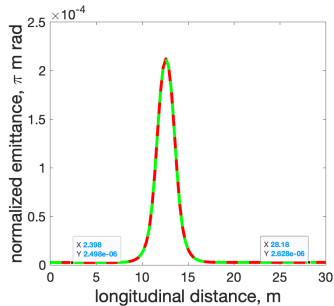


(a)

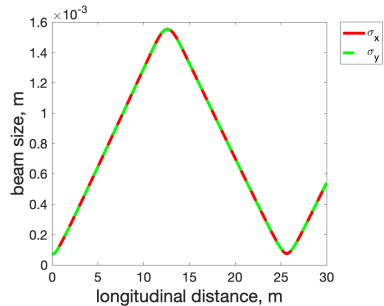


(b)

Solenoid radius 1 m

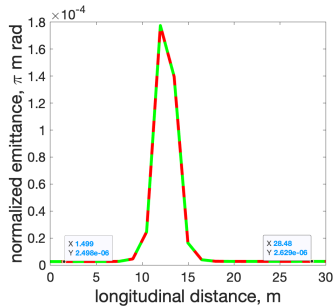


(a)

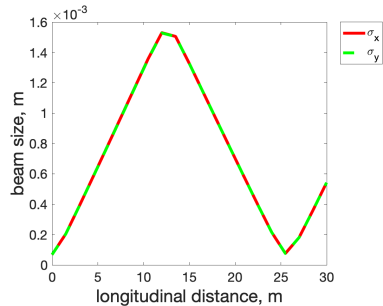


(b)

Solenoid radius 1 m, coarse timestep

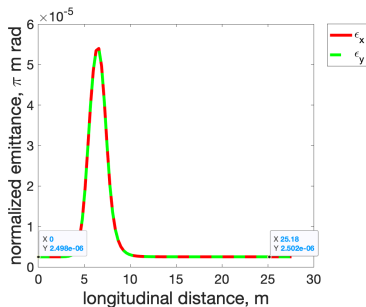


(a)

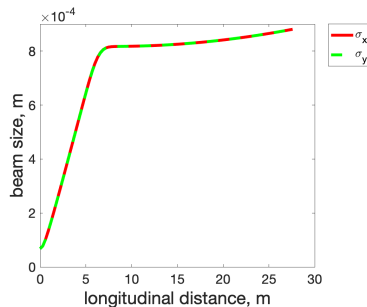


(b)

Solenoid radius 1 m, less drift to solenoid

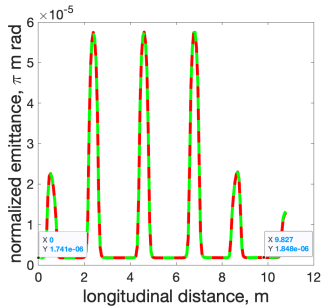


(a)

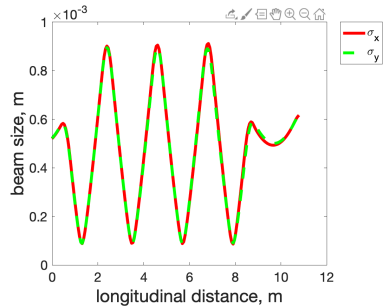


(b)

CeC experiment



(a)



(b)