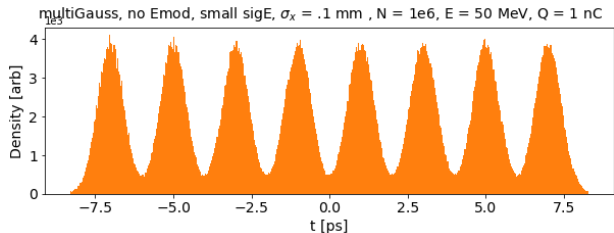


# Test with Wiggler Alone

## Input bunch

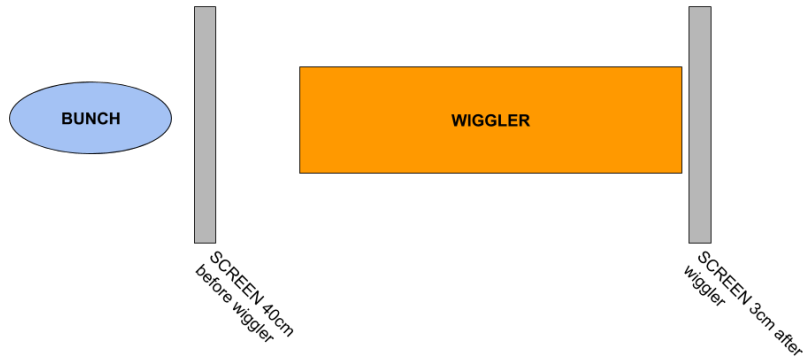
$E = 50\text{MeV}$	$\Delta t = 2\text{ps}$	$\sigma_{diff} \simeq \sqrt{\frac{FWHM_{pulse}}{2\pi}} \lambda_w = 2\text{mm}$
$\gamma_z = \frac{\gamma}{\sqrt{1 + \frac{K^2}{2}}} = 12.37$	$FWHM_{pulse} = 1\text{ps}$	$\sigma_{SC} \simeq FWHM_{pulse} \gamma_z = 3.7\text{mm}$



screen position = -0.4 m

# Test with Wiggler Alone

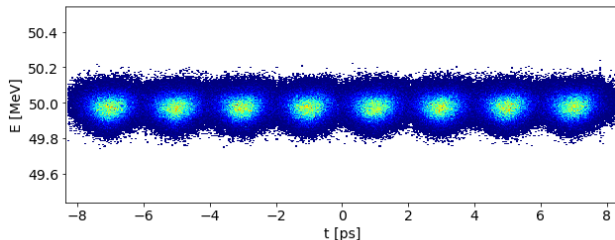
Schematics of the simulated scenario



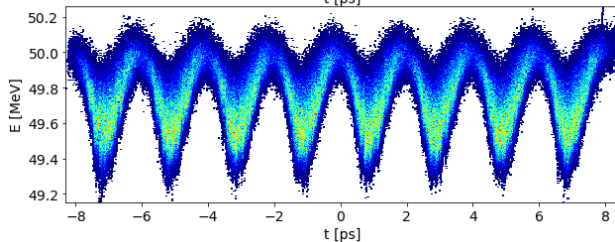
# Test with Wiggler Alone

Case  $\sigma_{\perp} = .1\text{mm} < \sigma_{diff}$  i.e. pencil-like approximation.

tests/test\_condition=pencil,  $\sigma_x = .1\text{ mm}$  ,  $N = 1e6$  ,  $E = 50\text{ MeV}$  ,  $Q = 1\text{ nC}$



screen position = -0.4 m

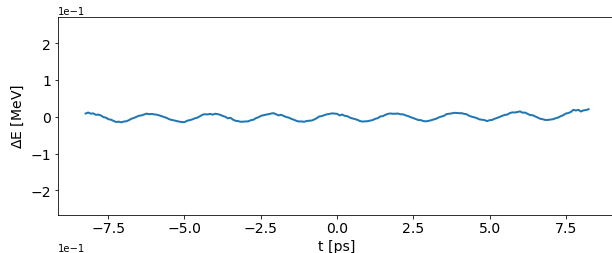


screen position = 0.88 m

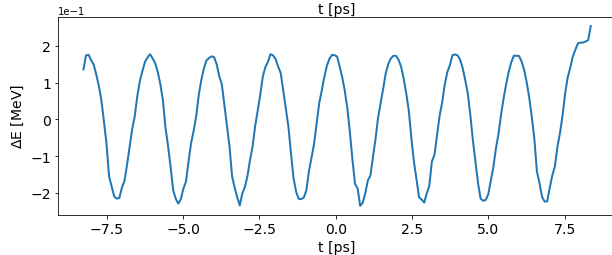
# Test with Wiggler Alone

Case  $\sigma_{\perp} = .1\text{mm} < \sigma_{diff}$  i.e. pencil-like approximation.

tests/test\_condition=pencil,  $\sigma_x = .1\text{ mm}$  ,  $N = 1e6$  ,  $E = 50\text{ MeV}$  ,  $Q = 1\text{ nC}$



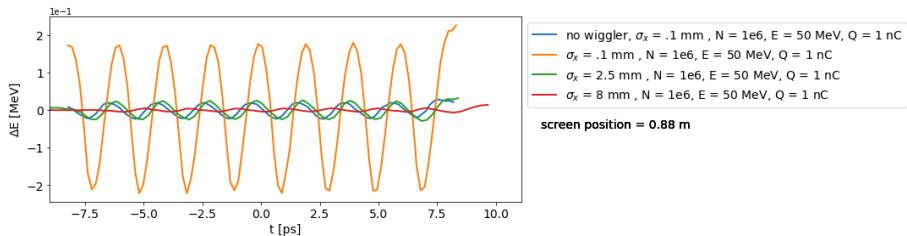
screen position = -0.4 m



screen position = 0.88 m

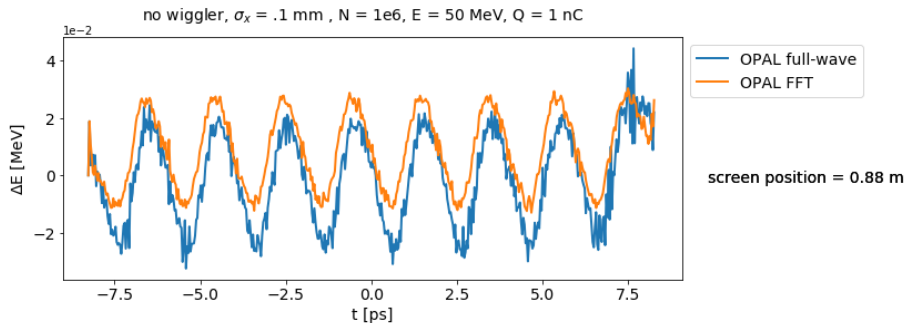
# Test with Wiggler Alone

Comparison different transverse sizes  $\sigma_{\perp}$ :



# Test with Wiggler Alone

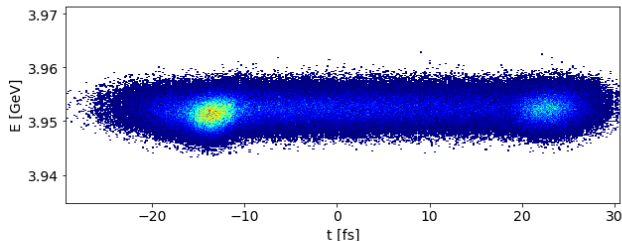
Benchmark between solvers in the case of no wiggler (i.e. a drift).



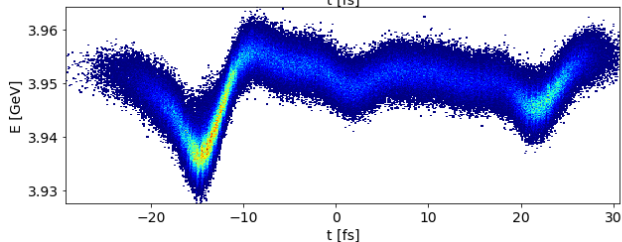
# Test with Wiggler Alone

Benchmark with J. MacArthur paper, experiment at LCLS.

tests/new\_emitted, OPAL emitted, dz = 100 nm, N = 5e5



screen position =  $-0.8$  m



screen position =  $2.2$  m

# Test with Wiggler Alone

Benchmark with J. MacArthur paper, experiment at LCLS.

tests/new\_emitted\_5e4, OPAL emitted, dz = 100 nm, N = 5e4

