Report for frontCollision

Simulated with: lib.managers.crankNicolson.dimensionless

Simulation constants:

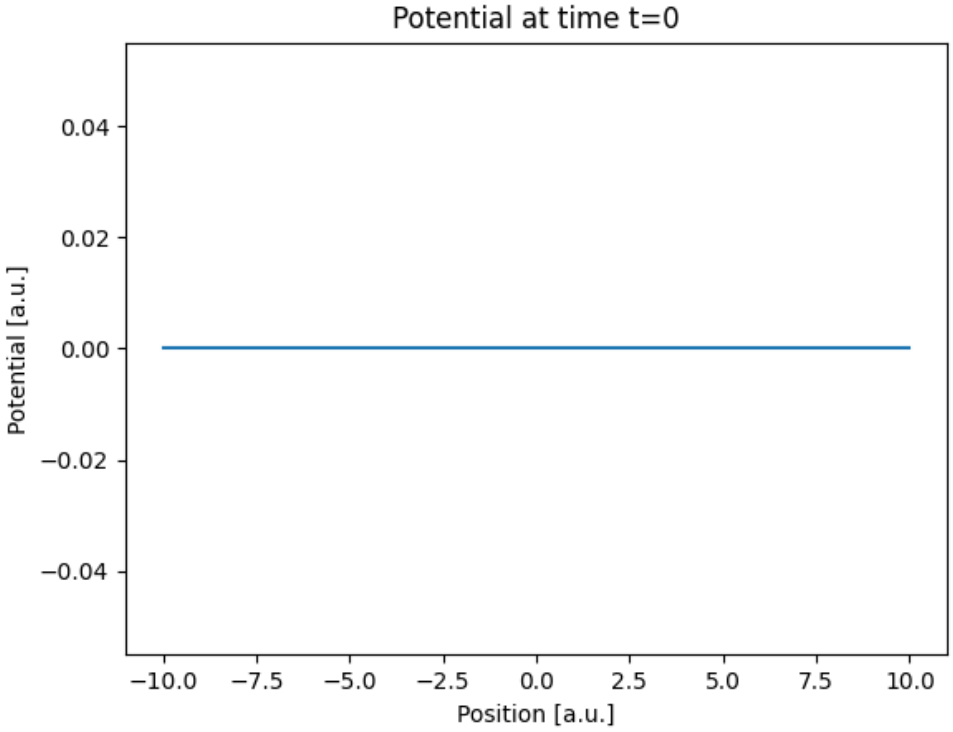
```
baseDensity: 1              chemicalPotential: 10       dt: 0.005

dx: 0.050                   g: -10                      hbar: 1

healingLength: 0.224        mass: 1                     plotFPS: 1000.000

plotPause: 0.001            plotStep: 10                plotYMax: 2

plotYMin: -2                r: 2.000                    tCount: 1000

tMax: 5                     tMin: 0                     velocity: 0

x0: 0                       xCount: 400                 xMax: 10

xMin: -10
```

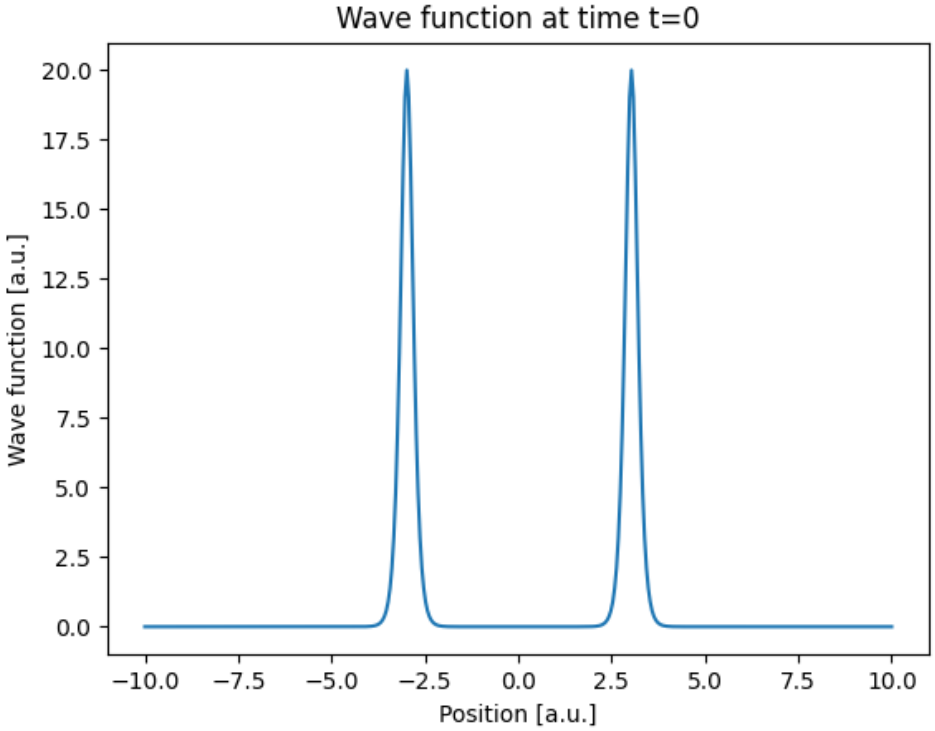
Wave function:

```
def waveFunction(x, t, constants):     eta = 1 / constants["healingLength"]

kappa1 = 1     omega1 = (kappa1**2 + eta**2) / 2     v1 = kappa1      kappa2 =

-1     omega2 = (kappa2**2 + eta**2) / 2     v2 = kappa2      x1 = -3     x2 = 3

wf1 = eta * jnp.exp(1j * kappa1 * (x - x1) - 1j * omega1 * t) / jnp.cosh(eta *

((x - x1) - v1 * t))     wf2 = eta * jnp.exp(1j * kappa2 * (x - x2) - 1j *

omega2 * t) / jnp.cosh(eta * ((x - x2) - v2 * t))     return wf1 + wf2
```

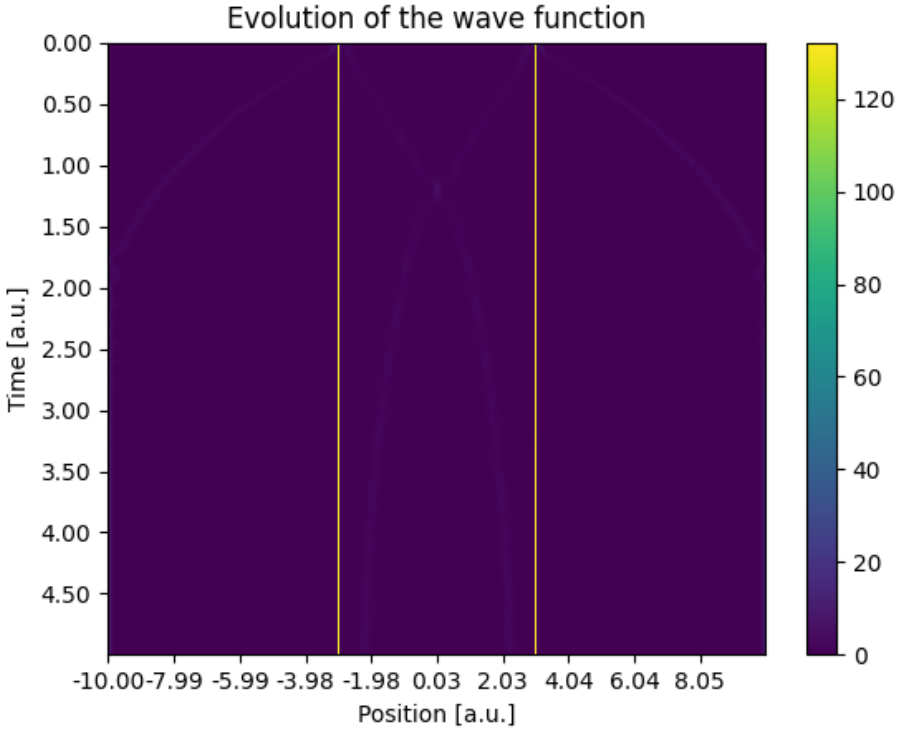
Potential function:

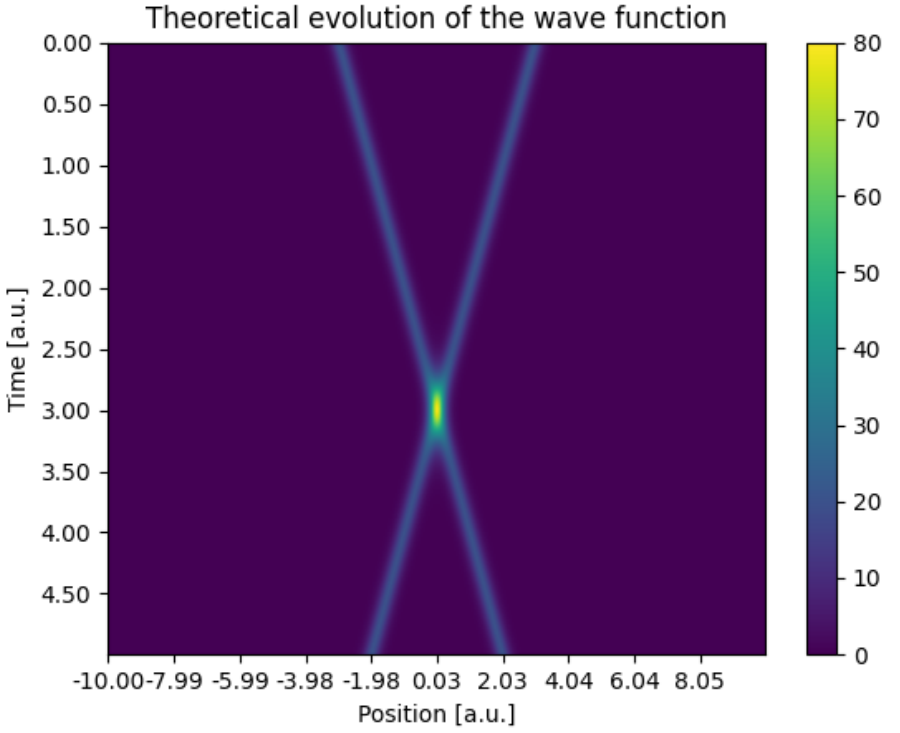
```
def V(x, t, constants):     return jnp.zeros_like(x)
```

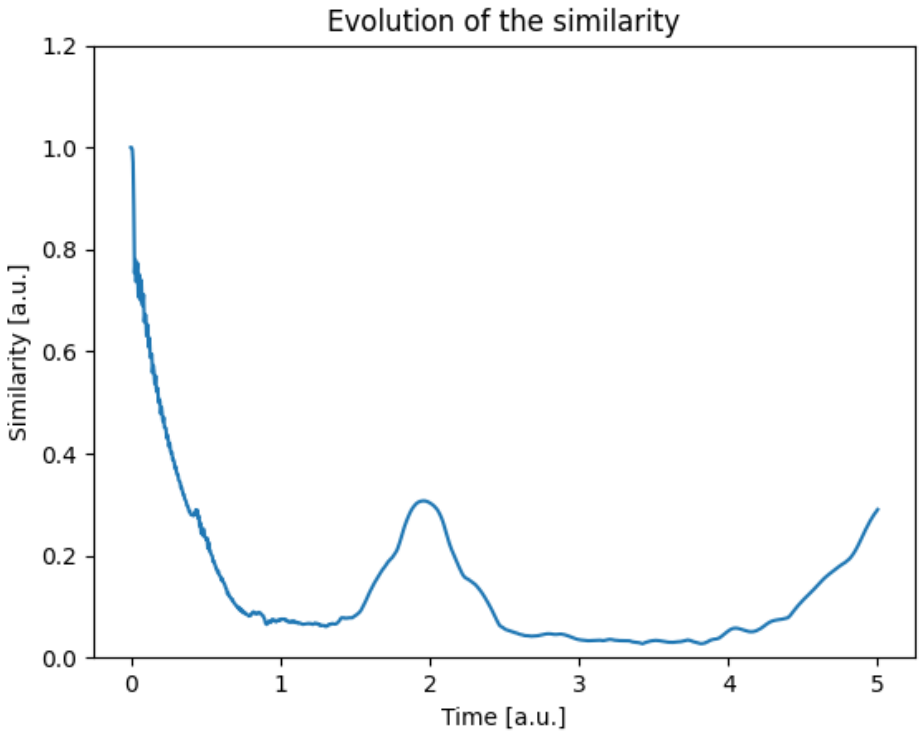

Potential at time t=0
Potential [a.u.]
0.04
0.02
0.00
−0.02
−0.04
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
Position [a.u.]

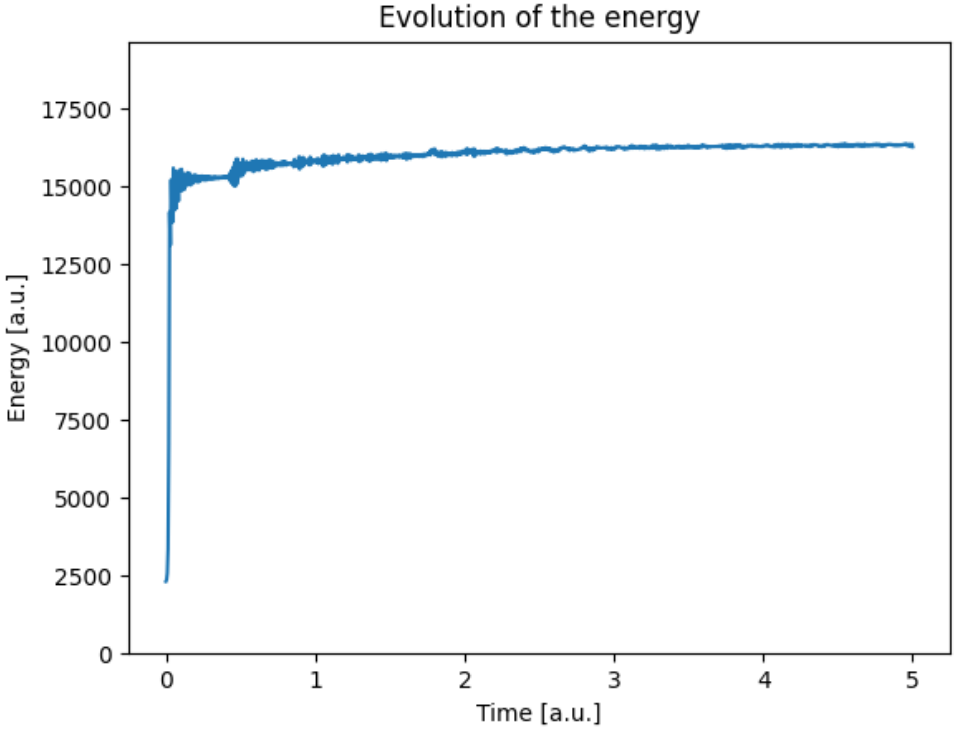

Wave function at time t=0
Wave function [a.u.]
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
Position [a.u.]

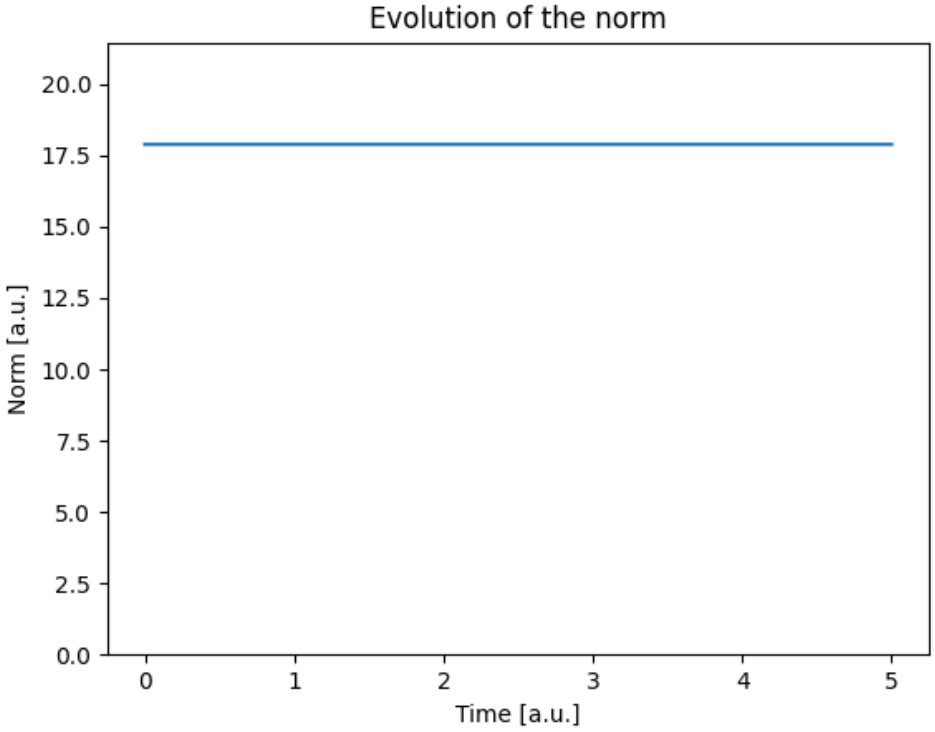
Results


Evolution of the wave function
Time [a.u.]
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
-10.00 -7.99 -5.99 -3.98 -1.98 0.03 2.03 4.04 6.04 8.05
Position [a.u.]
120
100
80
60
40
20
0


Theoretical evolution of the wave function
Time [a.u.]
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
-10.00 -7.99 -5.99 -3.98 -1.98 0.03 2.03 4.04 6.04 8.05
Position [a.u.]
80
70
60
50
40
30
20
10
0


Evolution of the similarity
Similarity [a.u.]
Time [a.u.]
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
1
2
3
4
5


Evolution of the energy
Energy [a.u.]
Time [a.u.]
0
2500
5000
7500
10000
12500
15000
17500
0
1
2
3
4
5


Evolution of the norm
Norm [a.u.]
Time [a.u.]
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
0
1
2
3
4
5