Report for oscillating_small_soliton

Simulated with: /home/mparcerisa/Desktop/code/TFG/BEC-Simulations/lib/managers/crankNicolson/dimensionless.py

Simulation constants:

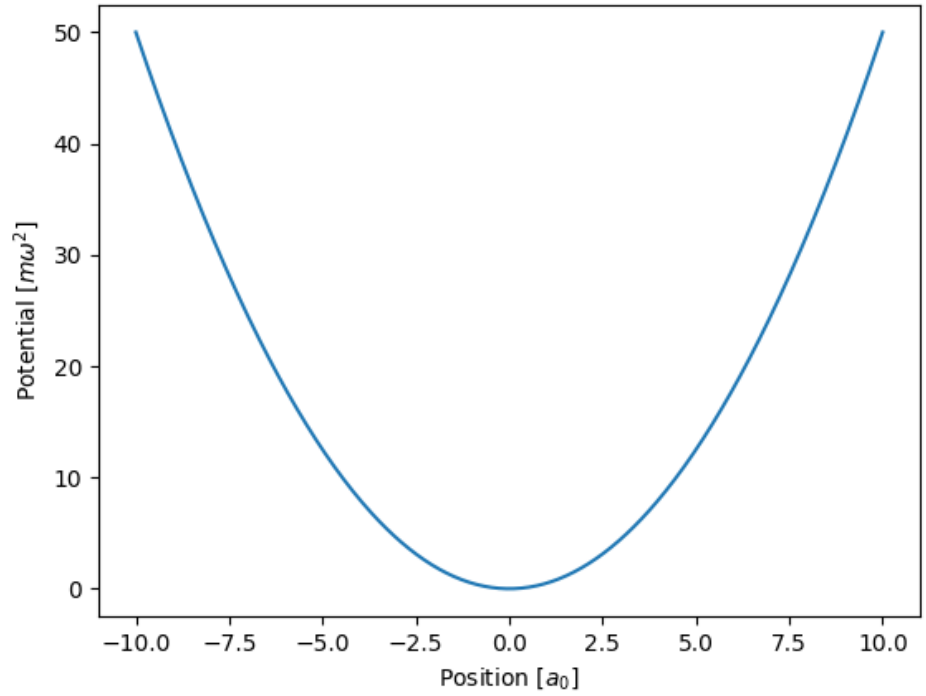
N: 1400	U0: -5.556	a0: 1.000
baseDensity: 1	dt: 0.005	dx: 0.050
hbar: 1.000	healingLength: 0.300	mass: 1.000
oscillationPeriod: 6.283	plotFPS: 1000.000	plotPause: 0.001
plotStep: 10	plotYMax: 2	plotYMin: -2
potentialW: 1.000	psi0: 1.000	r: 2.000
tCount: 1000	tMax: 5	tMin: 0
velocity: 0.000	x0: 1.000	xCount: 400
xMax: 10	xMin: -10	

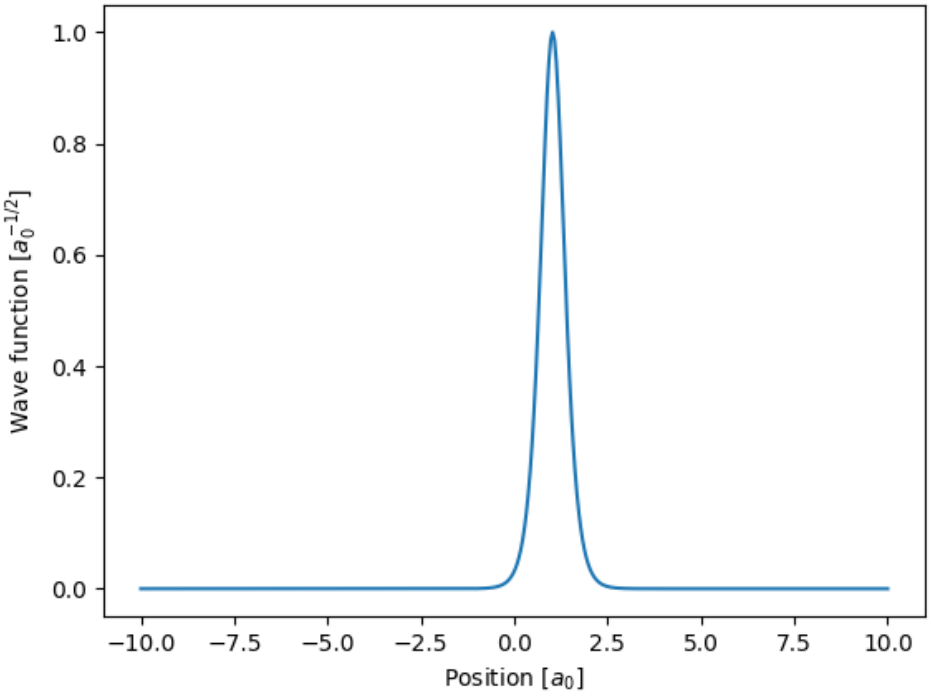
Wave function:

```
def waveFunction(x, t, constants):     """Displaced the soliton 0.01 a0 to the
right."""     psi0 = constants["psi0"]     xi = constants["healingLength"]
x0 = constants["x0"]      return psi0 / jnp.cosh((x - x0) / jnp.sqrt(2) / xi)
```

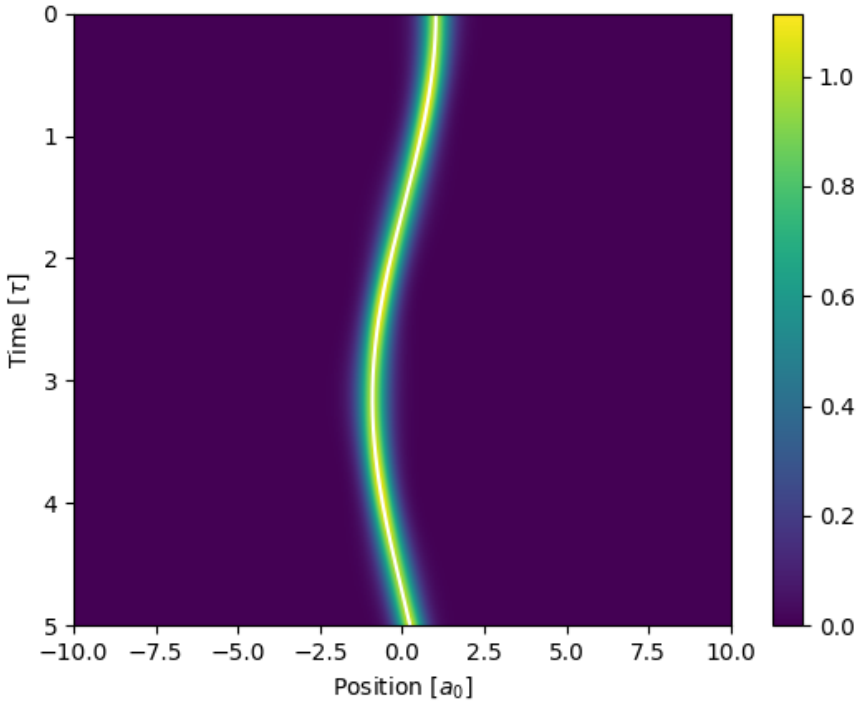
Potential function:

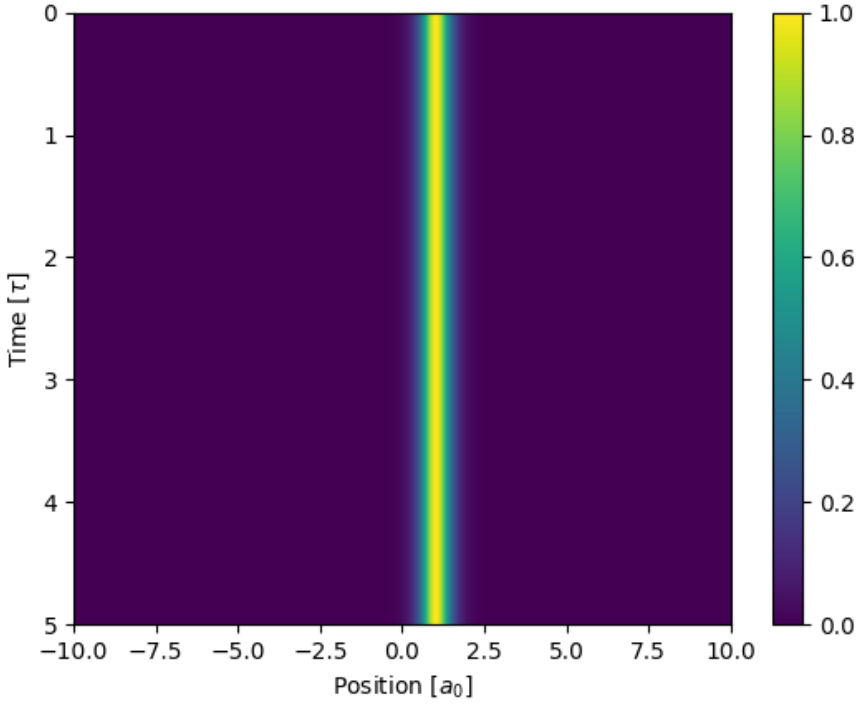
```
def V(x, t, constants):     return 1 / 2 * x**2
```

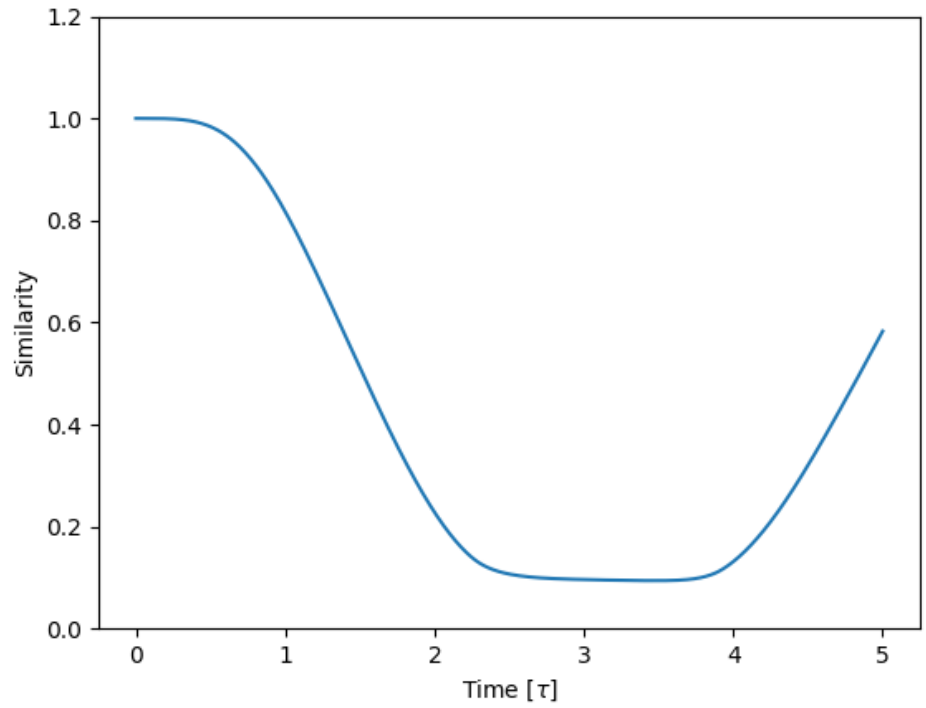

Potential [$m\omega^2$]
50
40
30
20
10
0
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
Position [a_0]

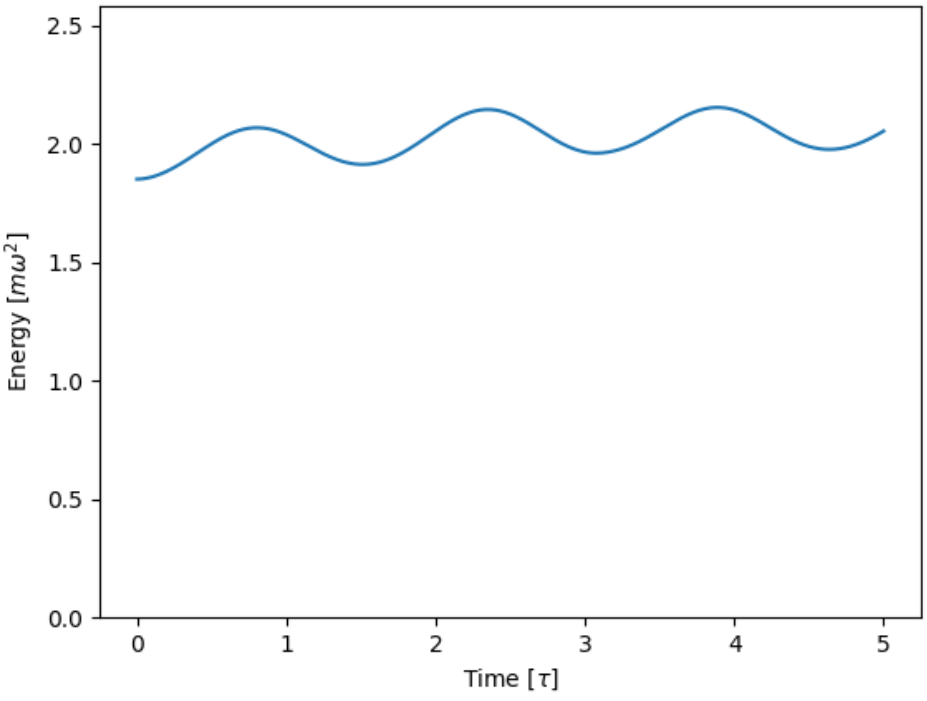

Wave function [$a_0^{-1/2}$]
1.0
0.8
0.6
0.4
0.2
0.0
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
Position [a_0]

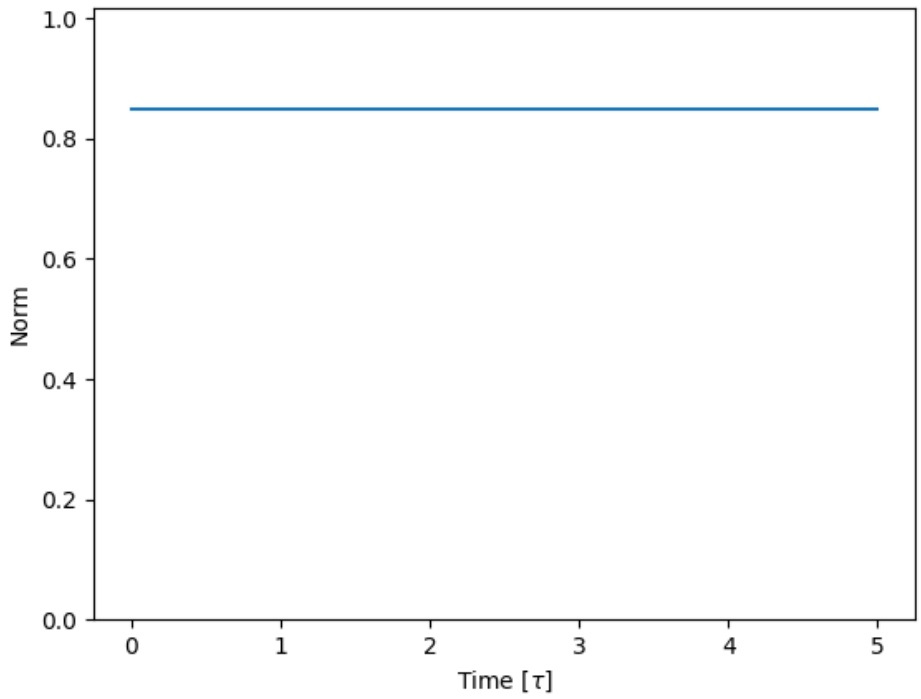
Results


Time [τ]
Position [a_0]
0
1
2
3
4
5
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
0.0
0.2
0.4
0.6
0.8
1.0


Time [τ]
Position [a_0]
0
1
2
3
4
5
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
0.0
0.2
0.4
0.6
0.8
1.0


1.2
1.0
0.8
0.6
0.4
0.2
0.0
Similarity
0
1
2
3
4
5
Time [τ]


2.5
2.0
1.5
1.0
0.5
0.0
Energy [$m\omega^2$]
0
1
2
3
4
5
Time [τ]


1.0
0.8
0.6
0.4
0.2
0.0
Norm
0
1
2
3
4
5
Time [τ]