Report for randomFrequency

Simulated with: lib.managers.crankNicolson.dimensionless

Simulation constants:

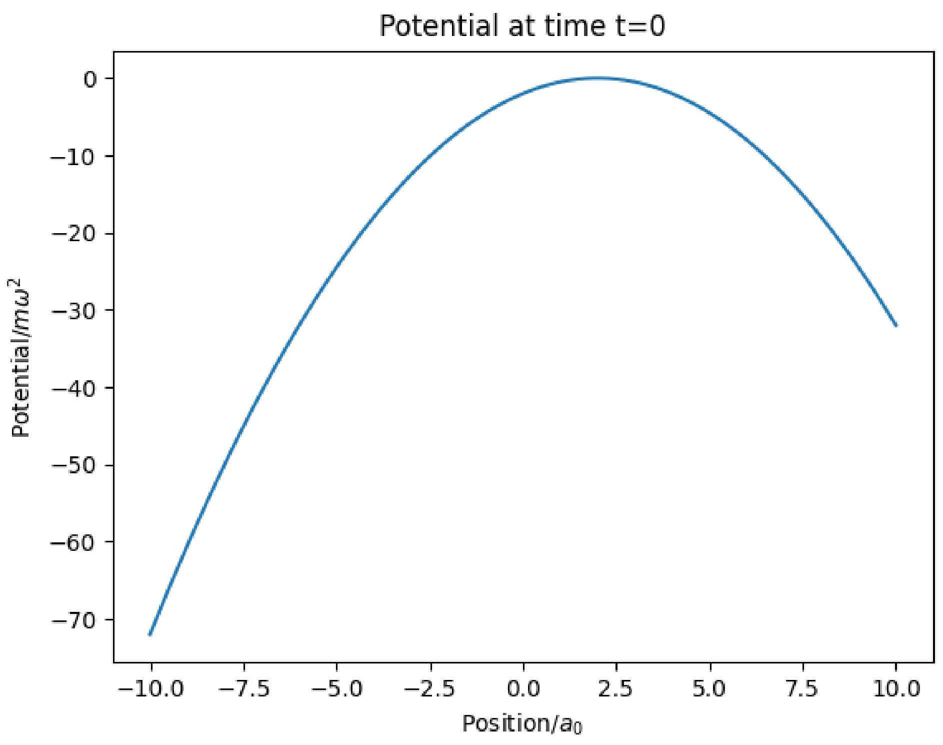
```
amplitude: 2.000            baseDensity: 1.000          chemicalPotential: 1.000

dt: 0.005                   dx: 0.200                   g: -1.000

hbar: 1.000                 healingLength: 0.707        mass: 1.000

plotFPS: 1000.000           plotPause: 0.001            plotStep: 10

plotYMax: 2                 plotYMin: -2                r: 0.125

tCount: 1000                tMax: 5                     tMin: 0

velocity: 0.000             w0: 2.000                   x0: 0.000

xCount: 100                 xMax: 10                    xMin: -10
```

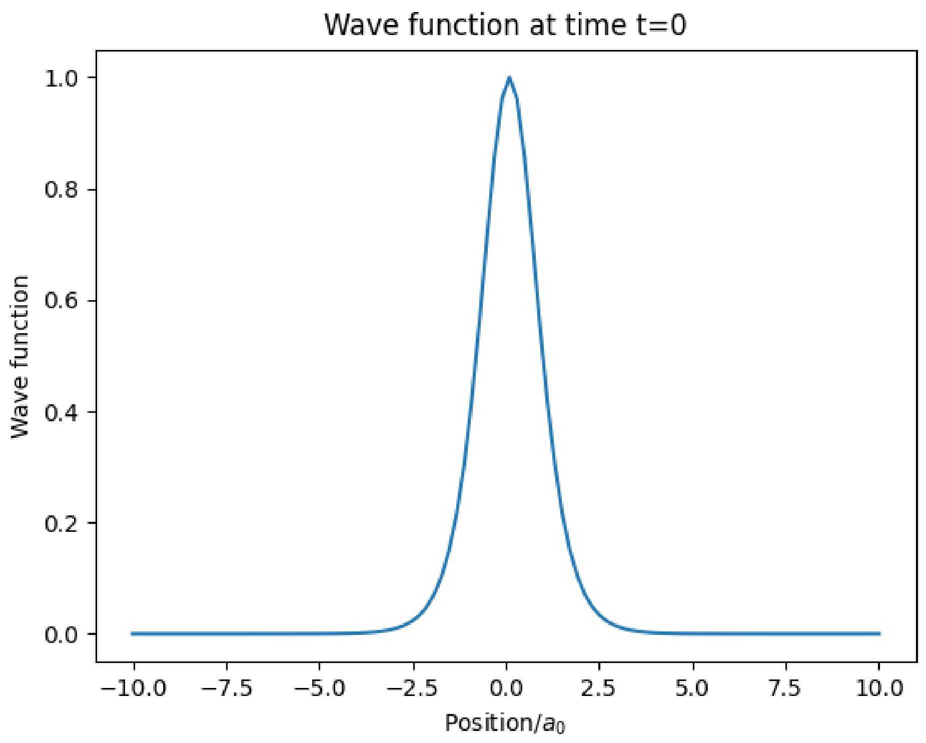
Wave function:

```
def brightSoliton(x, t, constants):     v = constants["velocity"]     g =
constants["g"]     x0 = constants["x0"]      eta = jnp.sqrt((v**2 + 2) / (-2 *
g))     kappa = jnp.sqrt(2 / (v**2 + 2))      spacePart = eta / jnp.cosh(((x -
x0) - v * t) / kappa) * jnp.exp(1j * (x - x0) * v)     timePart = jnp.exp(1j *
(1 / 2 - v**2 / 4) * t)      return spacePart * timePart
```

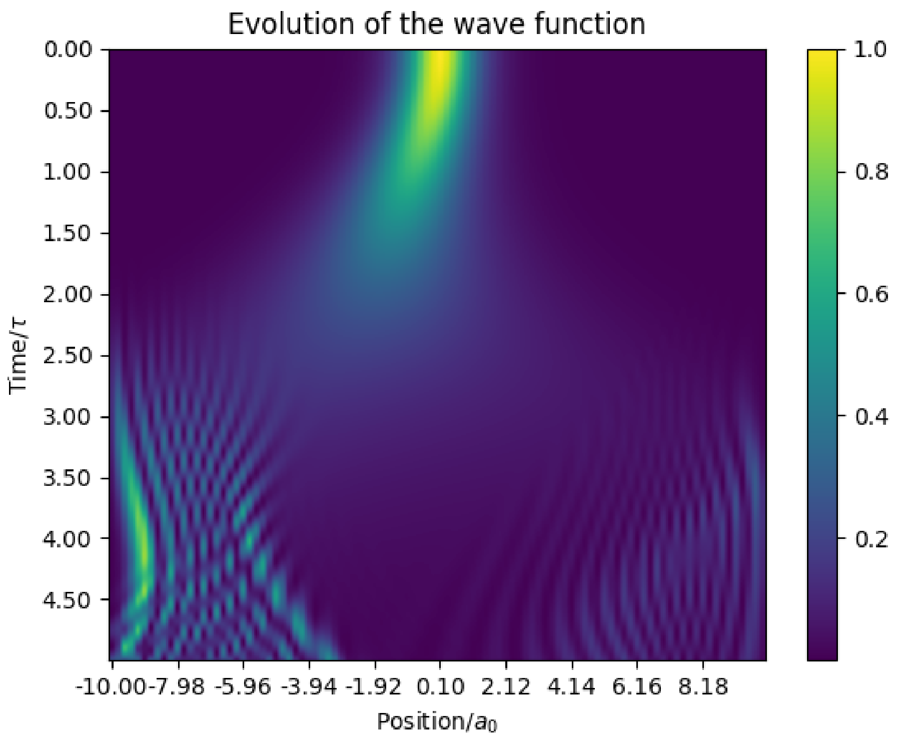
Potential function:

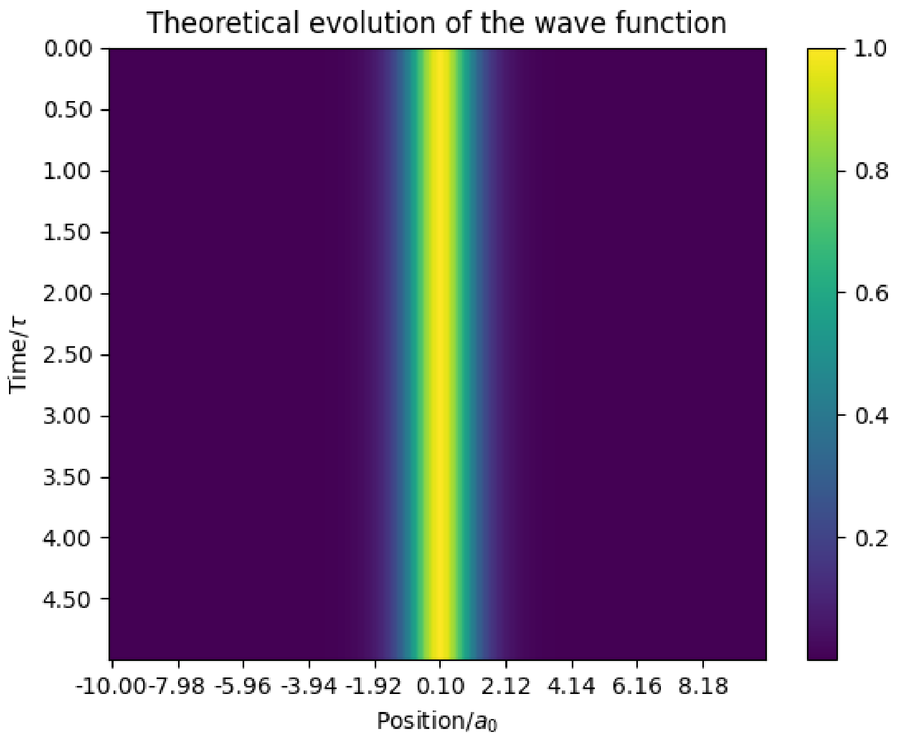
```
def V(x, t, constants):     x0 = constants["amplitude"] * jnp.cos(t *
constants["w0"])     return -((x - x0) ** 2) / 2
```

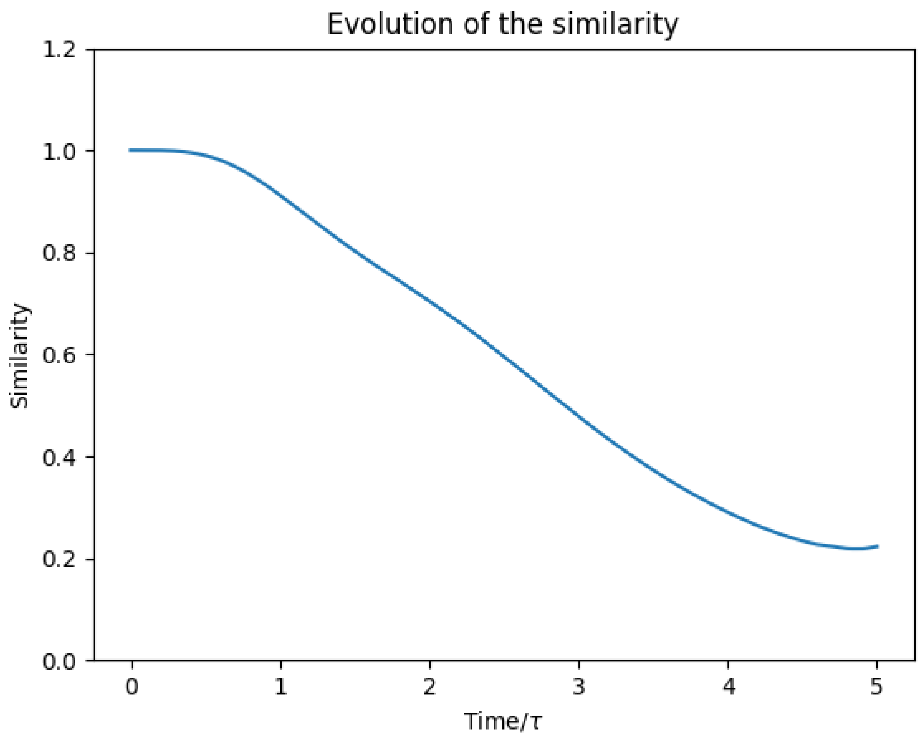

Potential at time t=0
0
−10
−20
−30
−40
−50
−60
−70
Potential/$m\omega^2$
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
Position/a_0

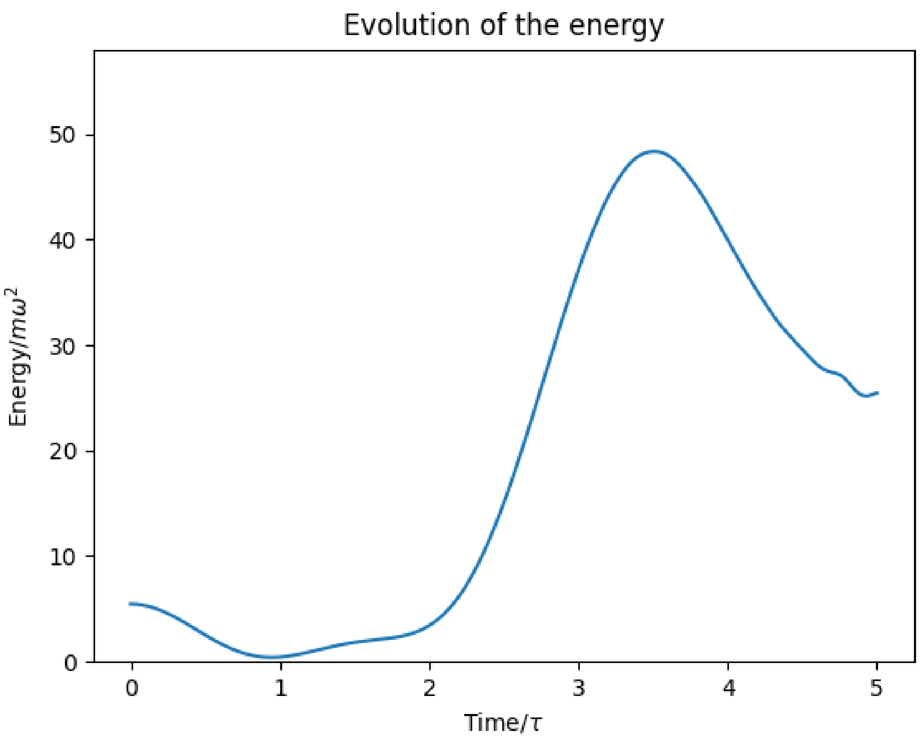

Wave function at time t=0
1.0
0.8
0.6
0.4
0.2
0.0
Wave function
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
Position/a_0

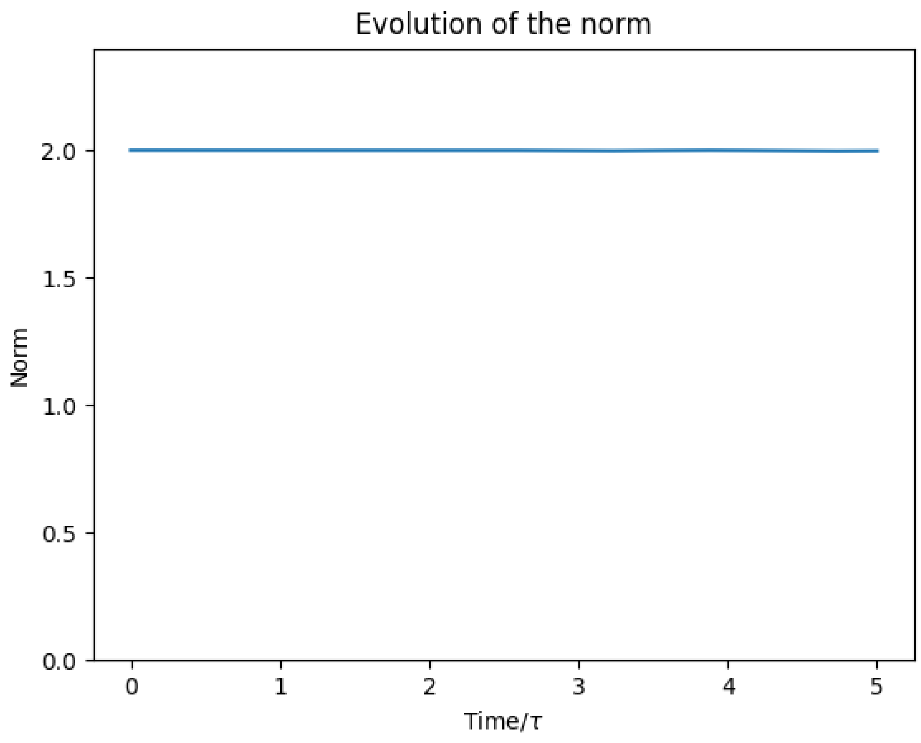
Results


Evolution of the wave function
Time/τ
Position/a_0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
-10.00
-7.98
-5.96
-3.94
-1.92
0.10
2.12
4.14
6.16
8.18
1.0
0.8
0.6
0.4
0.2


Theoretical evolution of the wave function
Time/τ
Position/a_0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
-10.00
-7.98
-5.96
-3.94
-1.92
0.10
2.12
4.14
6.16
8.18
1.0
0.8
0.6
0.4
0.2


Evolution of the similarity
Similarity
Time/τ
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/$m\omega^2$
Time/τ
0
10
20
30
40
50
0
1
2
3
4
5


Evolution of the norm
Norm
Time/τ
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4
5