1D Slow oscillations (A<<C0) (Numerical)

Kink dynamics

Consider a system with only two kinks. According to the kink's dynamics model, their distance decays as

$$\dot{d}(t) \simeq -24\sqrt{2}C(t)^{\frac{1}{2}}[e^{-2^{\frac{1}{2}}C(t)^{\frac{1}{2}}d} - e^{-2^{1/2}C(t)^{1/2}(L-d)}]$$

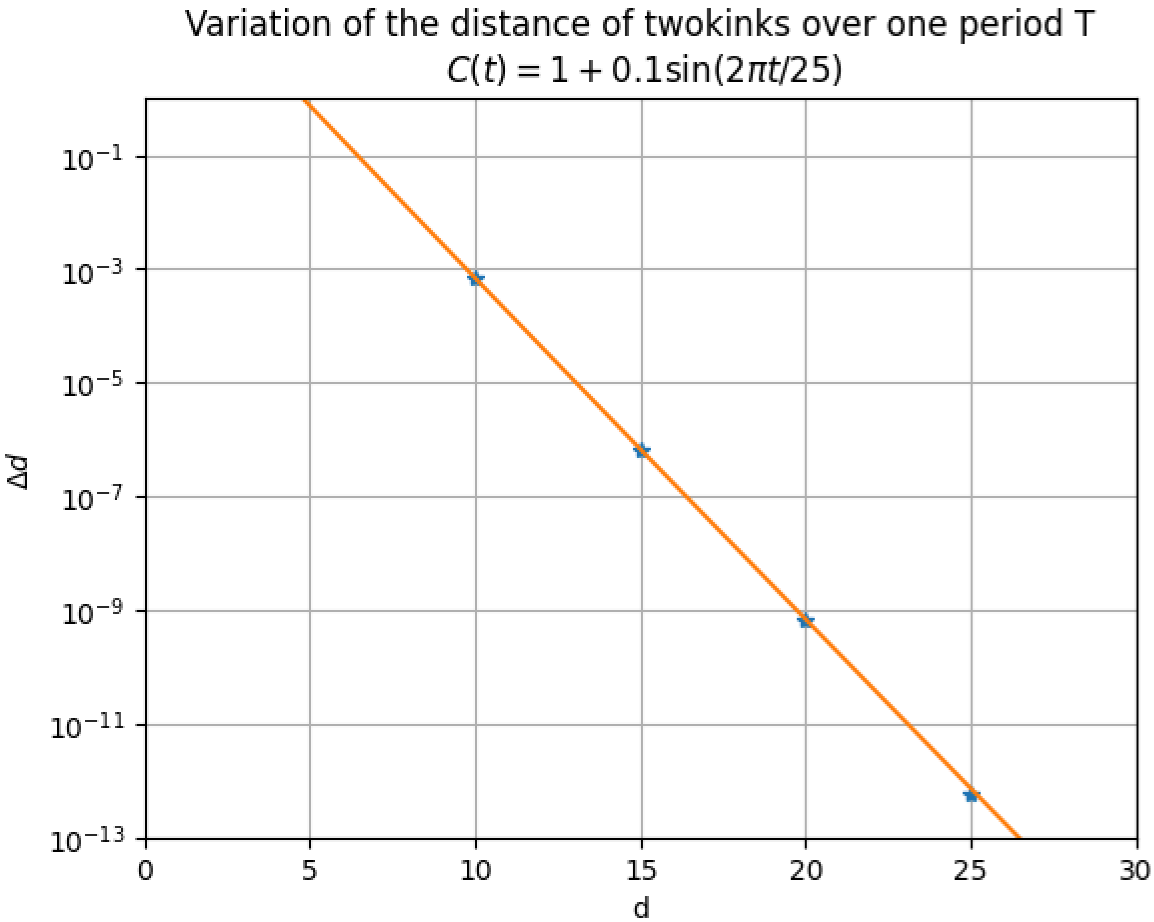
where L is the size of the simulation box.
The variation of the distance over a period (assuming the distant to be constant inside the integrand)

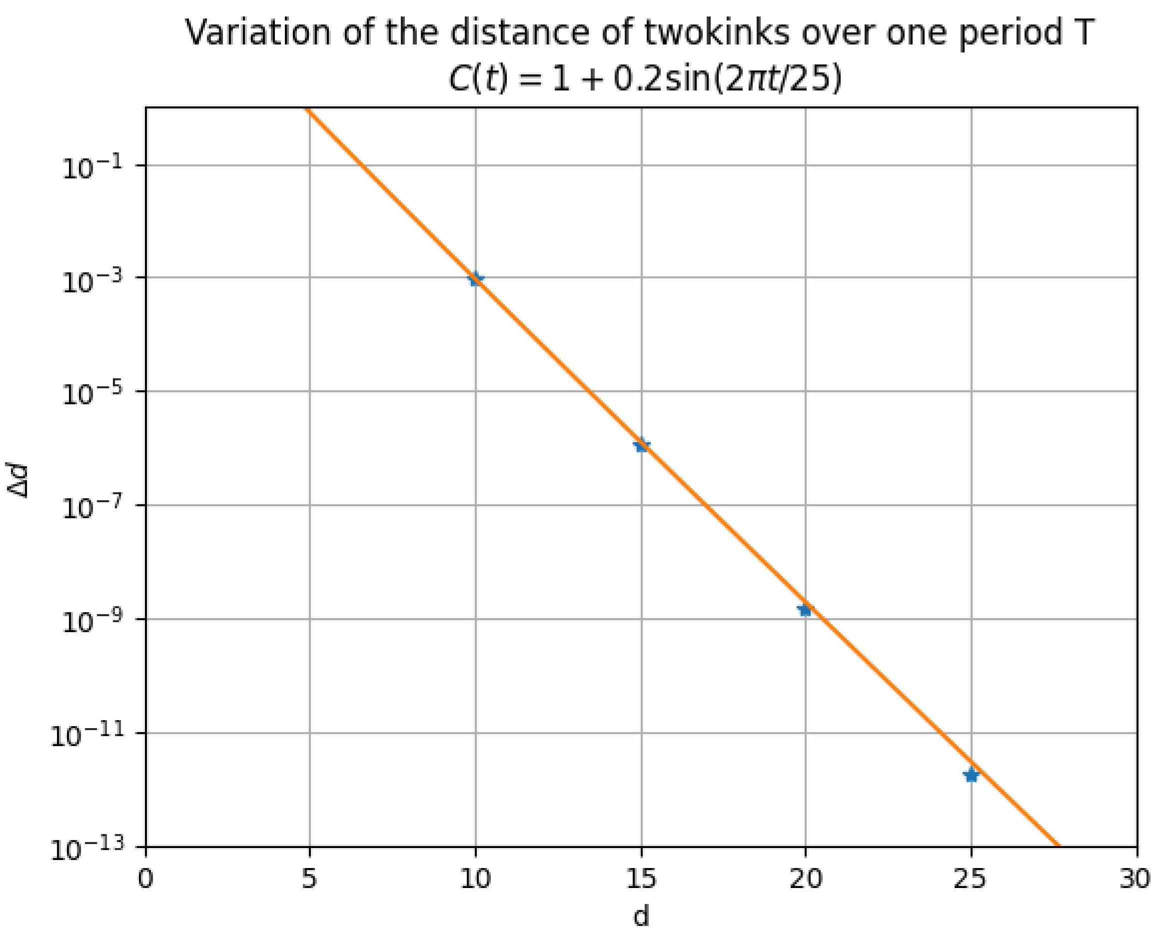
$$\Delta d(d) = \int_0^T (\partial_t d)dt$$

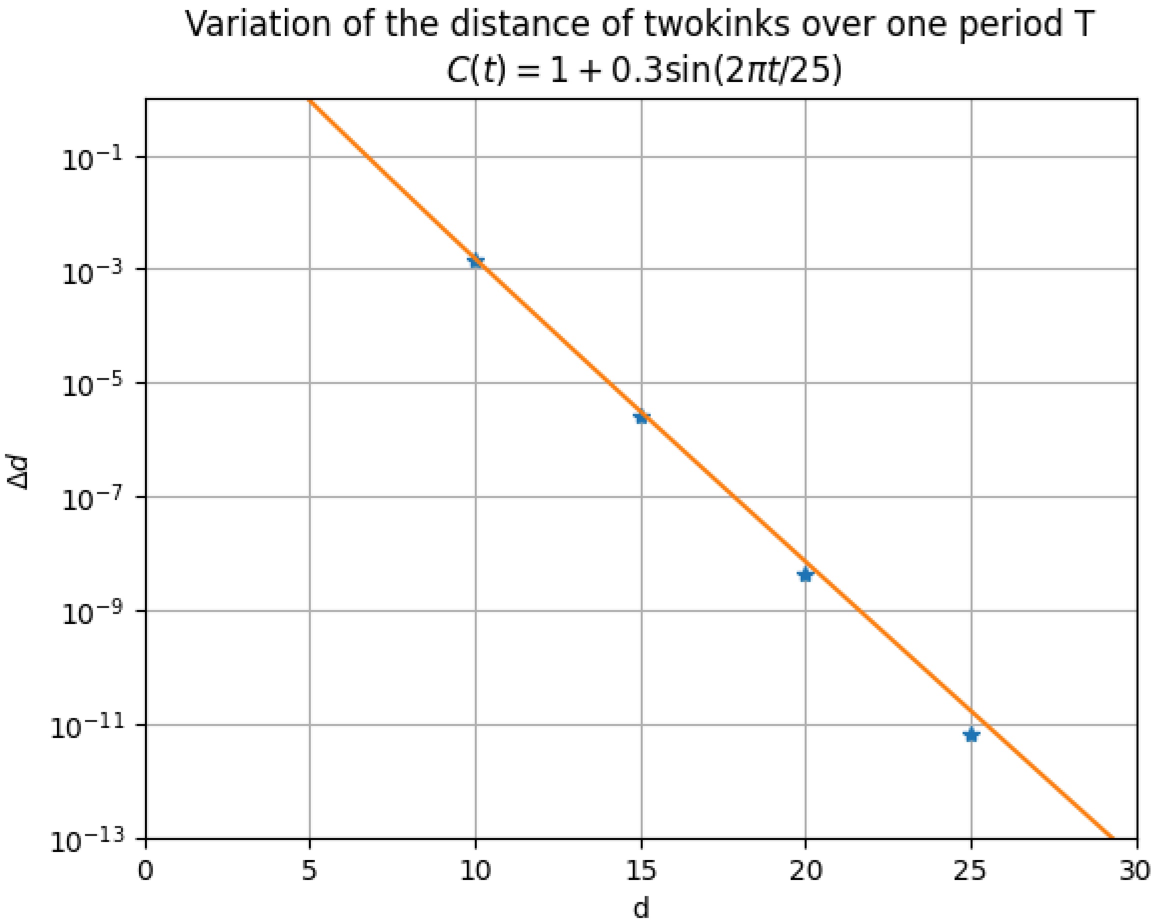
Simulations

In the following simulations

- The **orange** line: is the kinks dynamics model's prediction.
- The **blue** dots: are the experimental values (simulations)
  To **collect the data**
- Simulation of $\sim 10^2 T$ seconds were launched for many values of the initial distance d_0
- The quantity Δd has
- been calculated considering data with $t > 10T$, to cancel the influence of the initial state's preparation.
- The value displayed on the x-axis is the distance at the beginning of the period.


Variation of the distance of twokinks over one period T
$C(t) = 1 + 0.1\sin(2\pi t/25)$
Δd
10^{-1}
10^{-3}
10^{-5}
10^{-7}
10^{-9}
10^{-11}
10^{-13}
0
5
10
15
20
25
30
d


Variation of the distance of twokinks over one period T
$C(t) = 1 + 0.2\sin(2\pi t/25)$
Δd
10^{-1}
10^{-3}
10^{-5}
10^{-7}
10^{-9}
10^{-11}
10^{-13}
0
5
10
15
20
25
30
d



Linear dynamics

$$\ell = \frac{2\pi}{< q^2 >^{1/2}} \sim t^{1/2}$$

$\tau_{linear} \sim C(t)^{-1}$