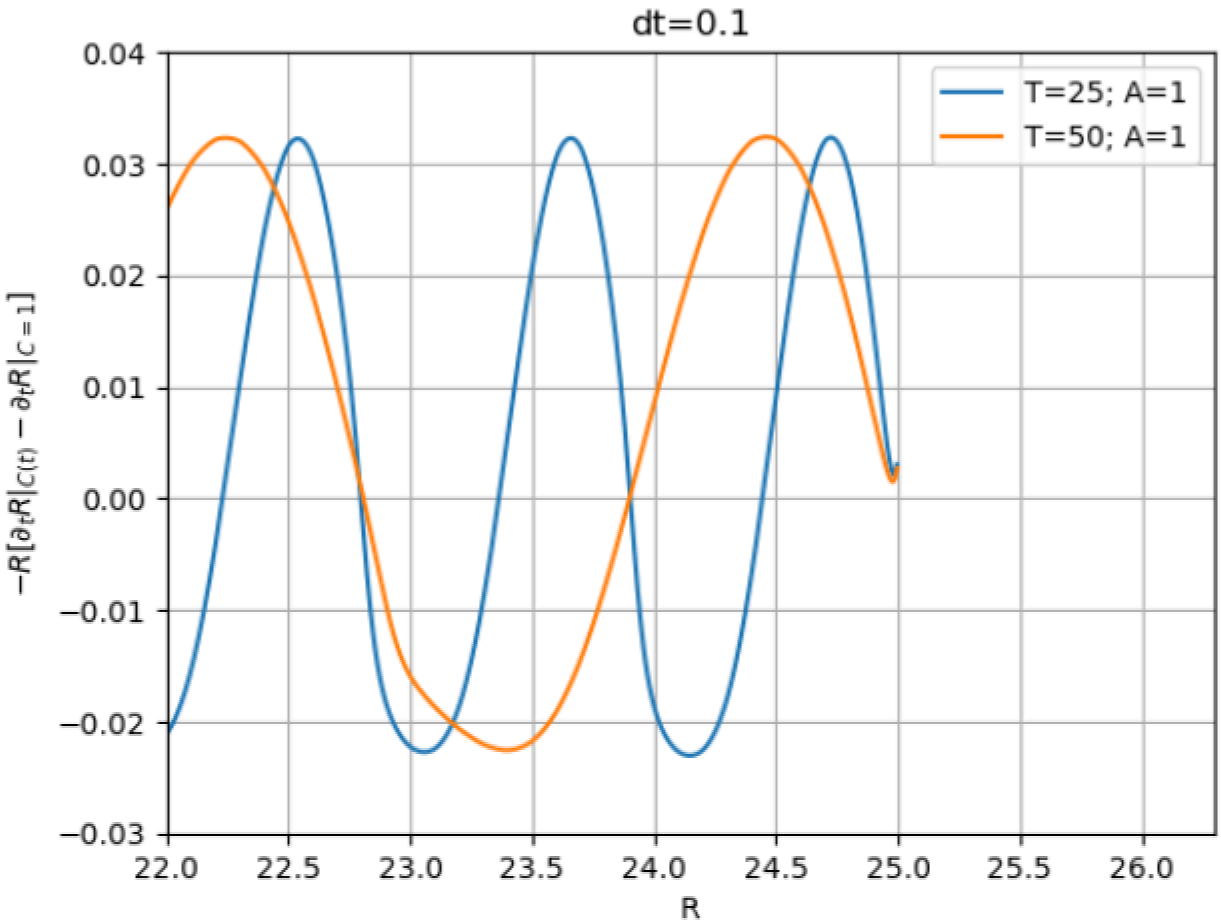
2D Slow oscillations (A>>C0) (Numerical)

Model-free analysis

Here we seek for the effect of oscillations on the dynamics of a circular domain, by **subtracting data** collected with $C = 1$ constant to data collected with $C(t) = 1 + A\sin\left(\frac{2\pi t}{T}\right)$.
We see an oscillation of this quantity. Is it a **numerical effect**?

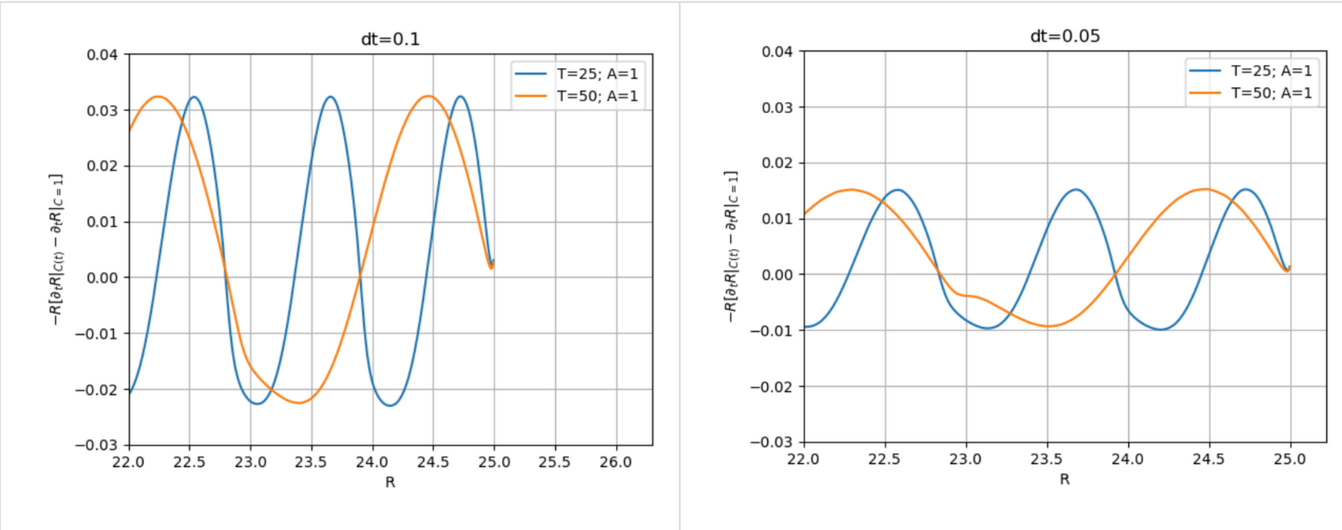


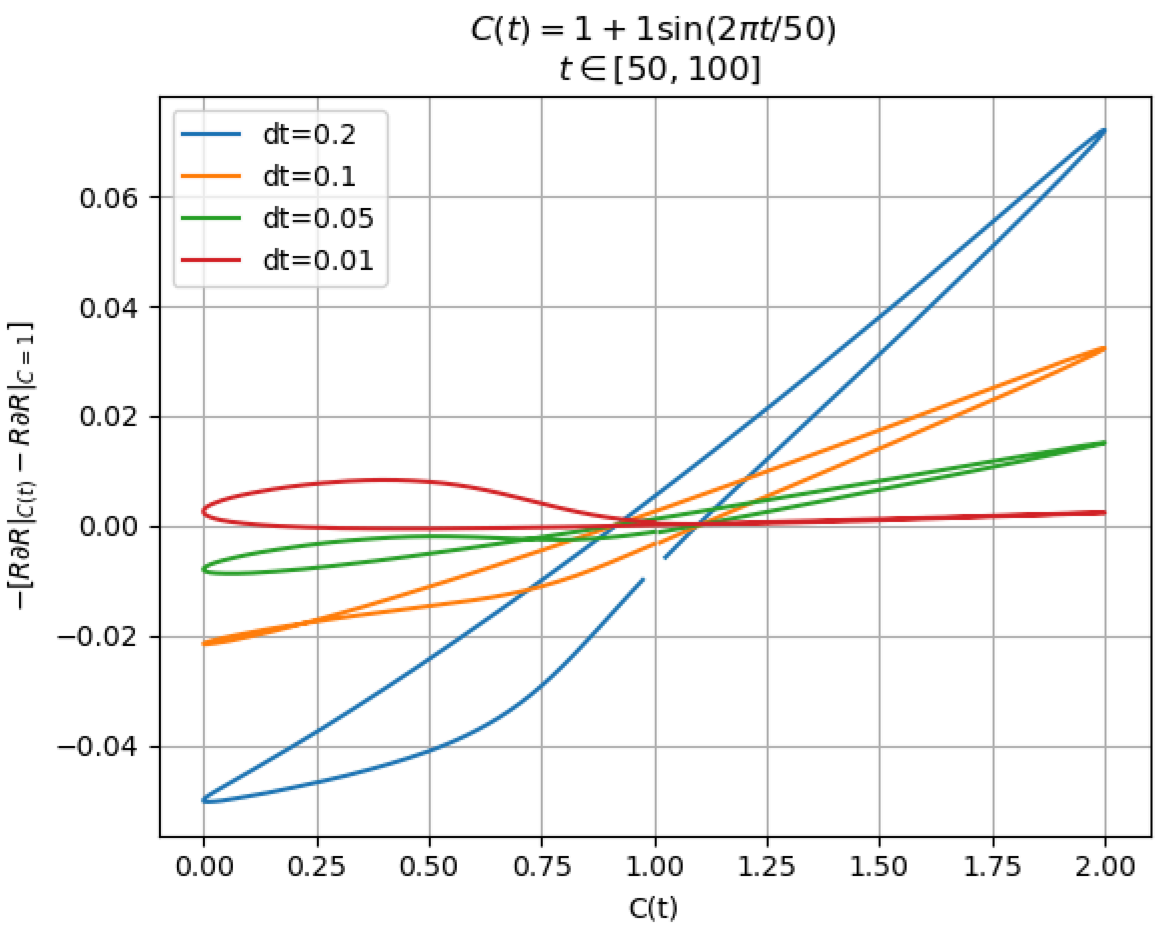
Numerical error

Oscillations in C introduce an oscillation in the deviation from the constant C curve.
We look at the difference between the curves:

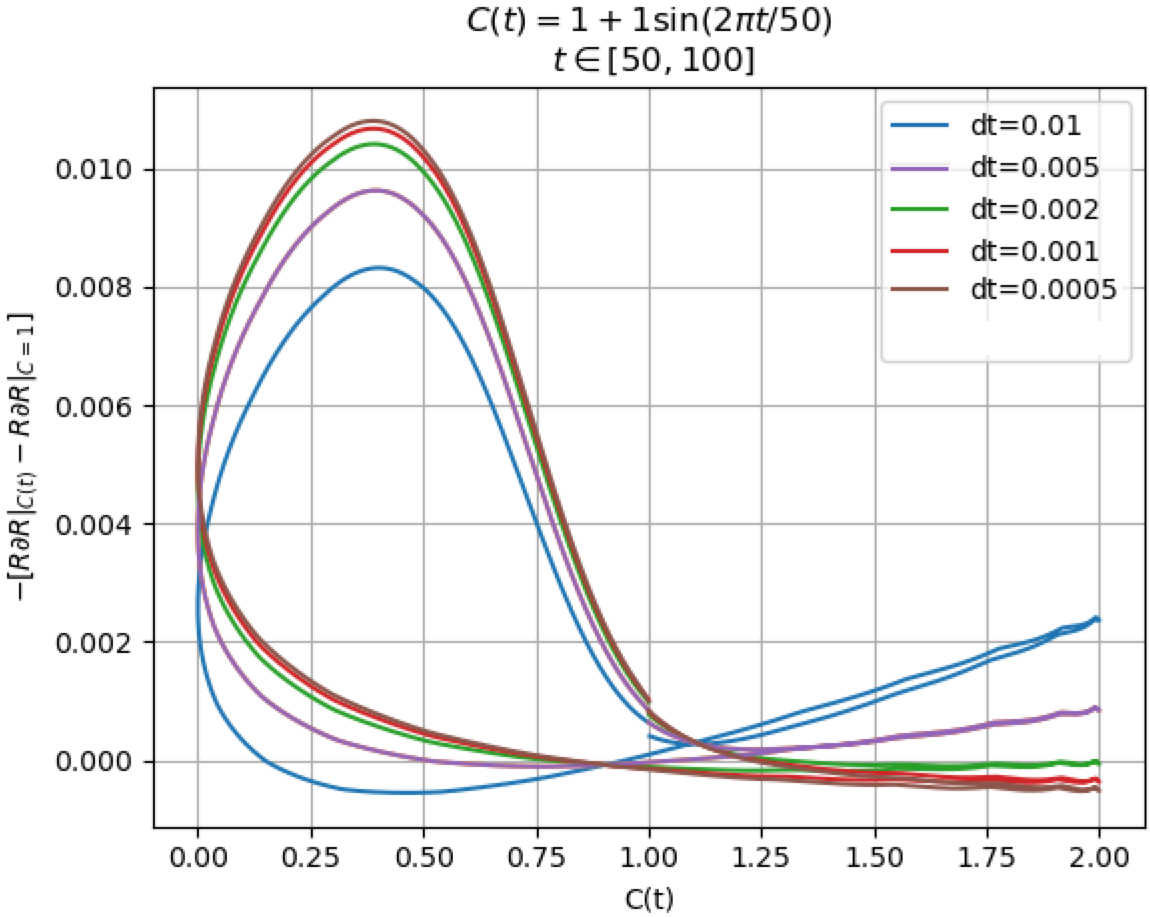
$$-[R\partial R|_{C(t)} - R\partial R|_{C=1}]$$

$A = 1$

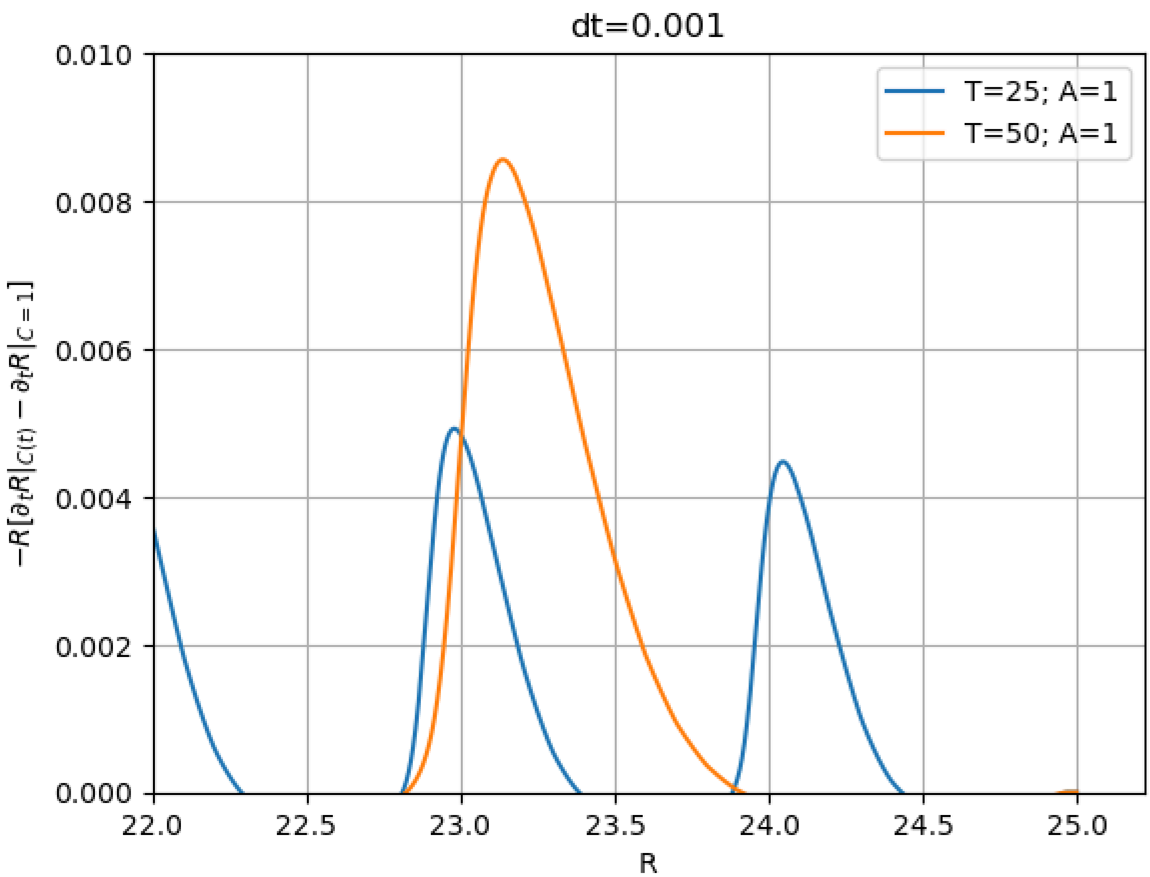




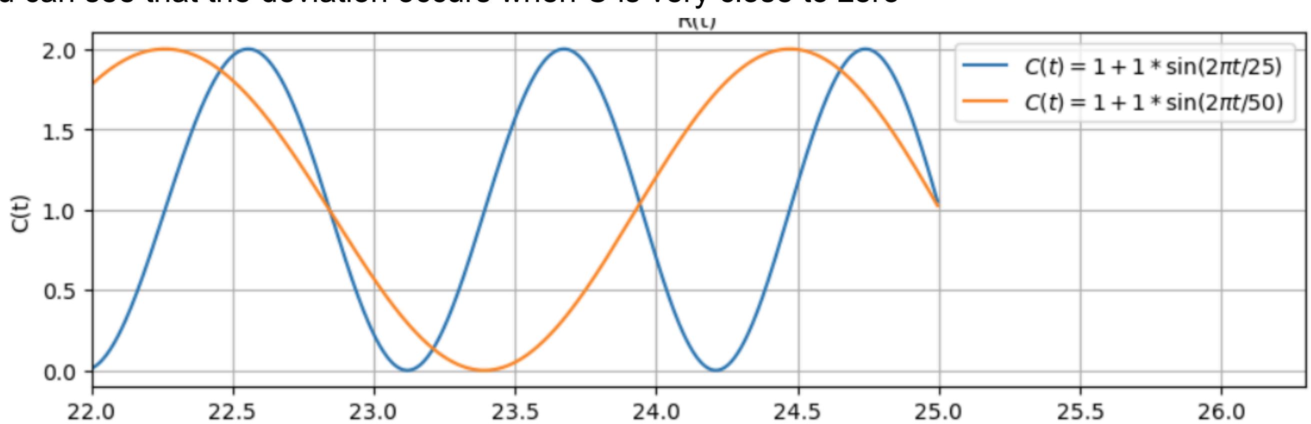
We see that the effect **does not** go to zero when $dt \to 0$! Let's see what happens for very small dt



This means it exists a **real** (non-numerical) **effect**. Let's see if it's amplitude is related to $\epsilon \sim \frac{1}{T}$



The amplitude of the deviation doubles if the period doubles, suggesting an effect of order ϵ^{-1} **????**.
You can see that the deviation occurs when C is very close to zero



Conclusion

There is a **real** deviation from the "constant C" dynamics. Thus deviation is doubled if the period is doubled and this suggests a $\sim \epsilon^{-1}$ correction, that is strange!!!