PS10

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https://github.com/PSH-hub24/phys-ga2000

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Q1

The instructions are pretty detailed in this assignment. I used banded.py to solve the linear system. However I couldn't get VPython working, so I instead plotted ψ at at 0 steps, 1000 steps, and 5000 steps. I also scaled the y-axis by 1e-9 as recommended by the instruction. Fig 1 shows a drift in the wavefunction as time increases, i.e., the region where the electron resides with high probability drifts in time.

Q2

I used dcst.py as instructed. Fig 2 plots ψ at $t = 10^{-16}$s, calculated by using the given formula and idst respectively. They match pretty well. Fig 3 plots the evolution of ψ, again a few snapshot since I couldn't get VPython working. The plot also shows a drift in the region where the electron moves with high probability, which matches the result in Q1.

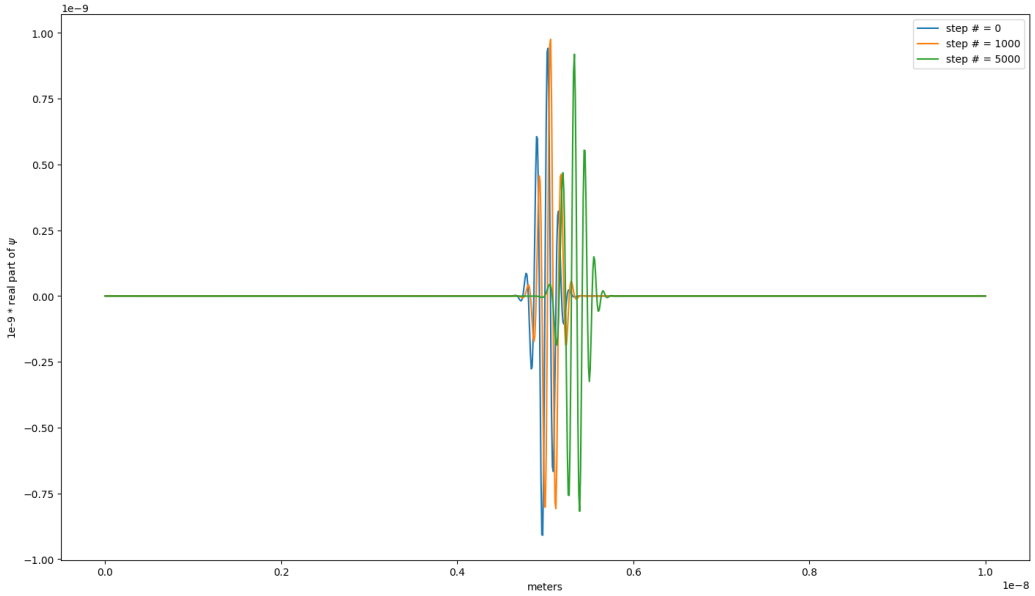

Figure 1: The real part of ψ at 0 steps, 1000 steps, and 5000 steps.

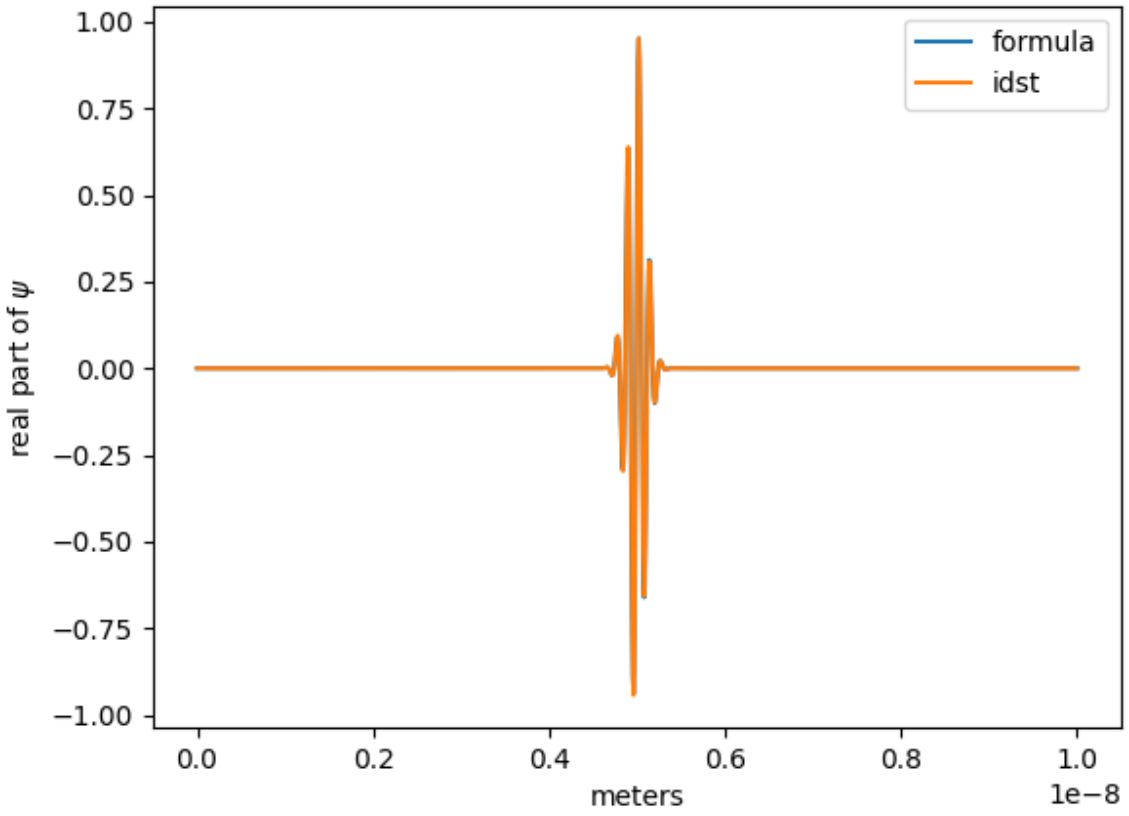

Figure 2: ψ at $t = 10^{-16}$s, calculated by the given formula and idst respectively.

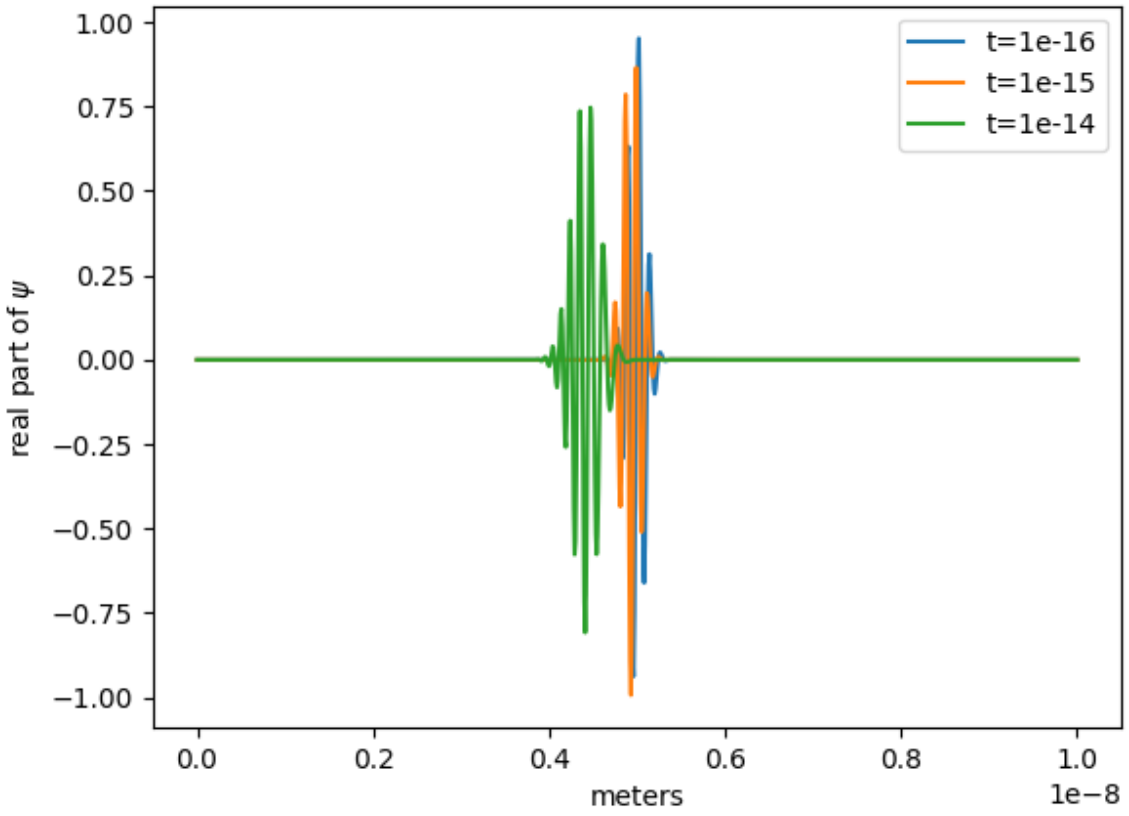

Figure 3: Time evolution of ψ