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HW 10

ASTE 546

For my first attempt, without incorporating k with a m=1 gives the inverse of the analytical solution.A screenshot of a graph

Description automatically generated

Now trying to incorporate k I get this:  
A graph with blue and orange lines

Description automatically generated

Maybe this needs to be incorporated to the Phase Space equation before it gets inverse FT’ed back to time space ..

My attempt to add the k term to the DFT function didn’t work, but this is the result with the k term code removed. The problem is definitely the implementation of the k term because this looks correct .. except a -k term would scale it properly.

A graph showing a graph

Description automatically generated with medium confidence

Well I thought I incorporated k correctly, like it’s done in the lecture and link but for m=1 I get this:  
  
A graph with blue and orange lines

Description automatically generated

So FT is still being scaled incorrectly

For m = 2 I get:

So now the amplitude and the period seems to be a little off…

A graph with orange and blue lines

Description automatically generated

Fixing the negative that was missing in my analytical solution and removing the i\*k implementation made it match for mode =1

A graph with orange lines

Description automatically generated

However we can see that with higher modes the amplitude doesn’t scale correctly:

A graph showing a chart

Description automatically generated

GOT IT TO WORK

I did not correctly implement x = I \*dx in function initially

double dx;

dx = L / N;

double x;

double c = 2 \* M\_PI \* mode / L;

for (int i = 0; i < N; i++) {

x = i \* dx;

rho[i] = eps0 \* sin(c \* x);

function[i] = -rho[i] / eps0;

}

M = 2

A graph of a function

Description automatically generated

M = 4

A graph on a white sheet

Description automatically generated