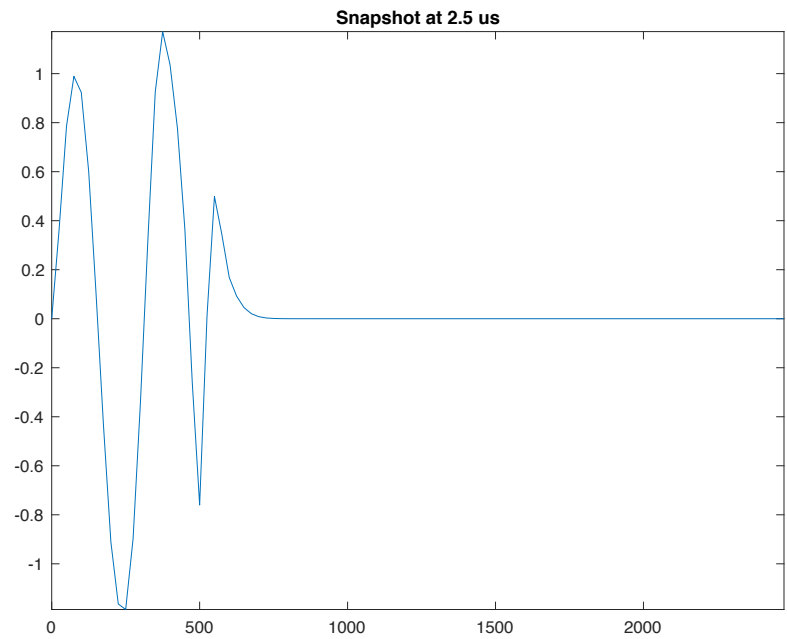


**ECE 6380 – Homework 5**  
**Caitlyn Caggia**

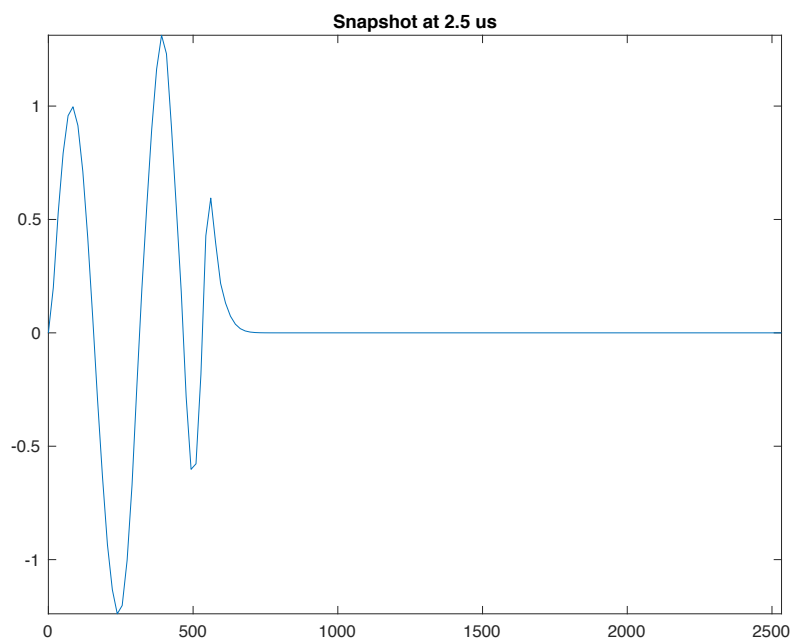
**Problem 2**

Mesh 1:  
 $L = 2500$ ,  $A = 2500$   
 $N_z = 100$ ,  $N_x = 100$   
CFL time step:  $5.8965 \times 10^{-8}$   
 $\delta t = 2.5 \times 10^{-8}$

slab starts at  $z = 500$



Mesh 2:  
 $L = 2500$ ,  $A = 2500$   
 $N_z = 150$ ,  $N_x = 150$   
CFL time step:  $4.0096 \times 10^{-8}$   
 $\delta t = 2.5 \times 10^{-8}$



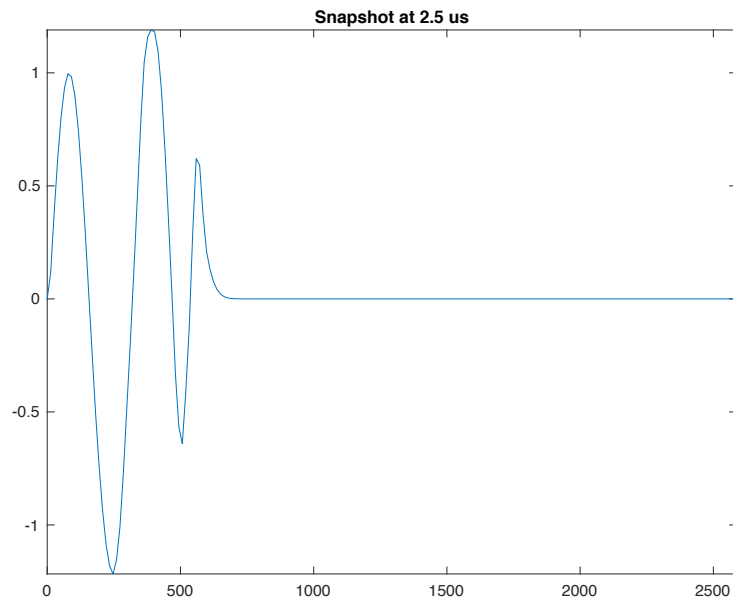
Mesh 3:

$L = 2500$ ,  $A = 2500$

$N_z = 200$ ,  $N_x = 200$

CFL time step:  $3.0662 \times 10^{-8}$

$\delta t = 2.5 \times 10^{-8}$



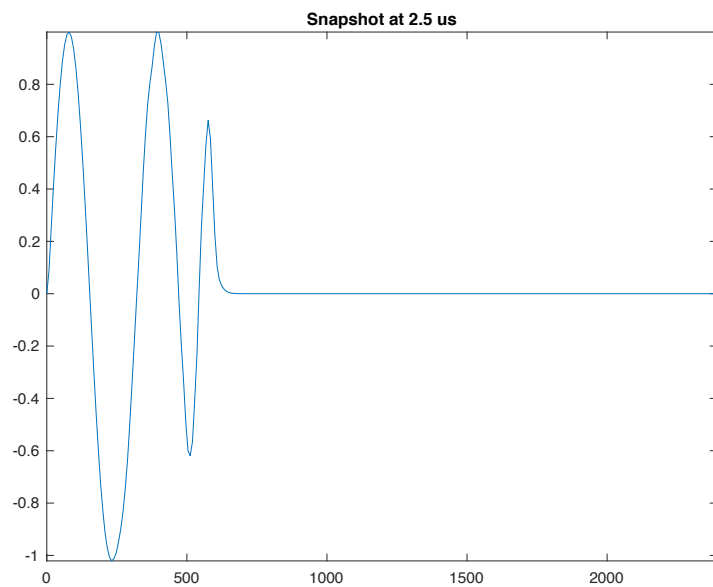
Mesh 4:

$L = 2500$ ,  $A = 2500$

$N_z = 300$ ,  $N_x = 300$

CFL time step:  $1.8869 \times 10^{-8}$

$\delta t = 1.25 \times 10^{-8}$



Grid spacing was chosen to be fine enough to not notice a significant change in plot shape or values when more points were used.

Time step was chosen to be less than CFL time step as calculated in the attached Matlab code.

Reflection and transmission coefficients were calculated using Equation 46 and 47 in Note 9.

reflection coefficient: -0.381966

transmission coefficient: 0.618034

The result has converged when adding additional points to the mesh does not significantly change the shape of the graph and its peak values.