Electricity and Magnetism II (PHY 322)

1D Scalar Wave Animation Homework

This homework is all about animating scalar waves in one spatial dimension. Download the file `ScalarWave1D.hs` from the course website.

Problem 1 (4 points) The file `EMWave1DTE.hs` has an example of a standing EM wave in which three half-wavelengths fit across the region we are keeping track of. Make a standing EM wave in which five half-wavelengths fit across the region we are keeping track of.

Problem 2 (4 points) The file `EMWave1DTE.hs` has an example of a wave produced by an oscillating current density. Change the current density to a single pulse of some shape and animate the resulting wave.

Problem 3 (4 points) The file `EMWave1DTE.hs` has an example of a wave produced by an oscillating current density in the middle of the region we are studying. Change this to a current density that oscillates the same way in time, but at two locations separated by half of a wavelength. You should be able to see some interference effect.

Problem 4 (4 points) The file `EMWave1DTE.hs` has an example of a wave produced by an oscillating current density in the middle of the region we are studying. Change this to a current density that oscillates the same way in time, but at two locations separated by a whole wavelength.