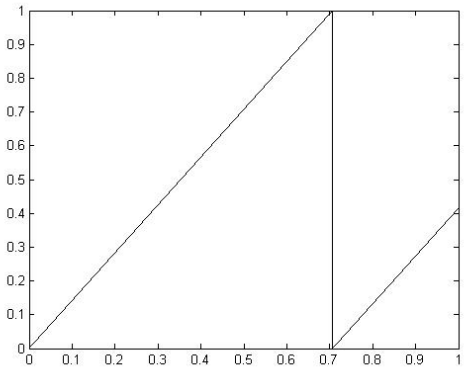
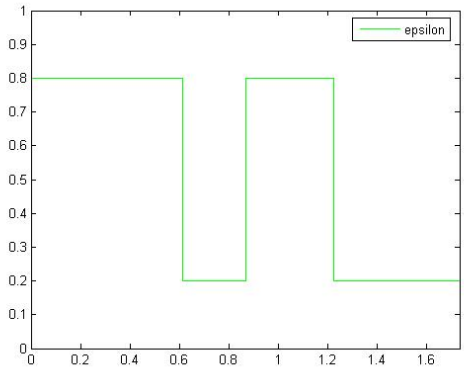
REU Report Summer 2005

This summer I continued my research with Ken Golden. I worked on Matlab programs meant to model the band structures of electromagnetic waves with periodic wavelength. Specifically, I spent time designing a program that takes a slice of a two-dimensional checkerboard and creates a one-dimensional array of conductivities. For example, the following figure show a line of slope $\sqrt{2}$ cutting through a 1 by 1 checkerboard with $\varepsilon=0.8$ in the lower left and upper right squares (0.5 by 0.5 squares) and $\varepsilon=0.2$ in the upper left and lower right squares. The other figure is the corresponding values for epsilon as a function of the length of the line.





I have yet to perfect these programs to acquire data suitable to be used in a program created by David Dobson. This project has been put on hold due to another, more urgent project I am a part of with Jingyi Zhu and Ken Golden. For this current project, we are working on using sea ice data from Hajo Eicken and solving for effective properties of the ice using a program create by Jingyi.