ELEC 4700 EM and the Yee Cell

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March 24th, 2022. Due March 27th @ midnight.

Goal In this PA you will use a Yee Cell FDTD simulator to investigate numerical and physical phemonena.

Tasks

1. Download the Yee Cell Code from the link provided on the web page and Unzip the file.
2. Basic Simulation:
   (a) Open "SoftSimpleReg.m" and run the file.
   (b) What is it simulating?
   (c) Have a look at *SoftSimpleRed* and explore what it is doing and add comments to the code.
      i. Find the code that adds the "inclusion". Comment it out. Did that work?
      ii. What is the *bc* structure used for?
      iii. *bc{1}.s(1)* is setting up what? Play with paramaters to see what they do.
      iv. *bc{1}.xm/xp/ym/yp* are used for what? Try setting *bc1.xp.type = 'e'* what happened?
3. Geometric Changes:
   (a) Create a grating by adding more inclusions.
   (b) Simulate the grating. You might find it useful to set the "st" paramater to -0.05. What did that do?
   (c) Try varying the frequency of the excitation.
4. Be creative:
   (a) Create an interesting structure for scattering.
   (b) Add multiple sources.

Checkout When you are finished:

1. Create a new repo on your github account called YCPA
2. Clone the repo to your machine
3. Add your code to the repo, commit, and push it back to github
4. Check that it worked, if it did, you're all set