% DRAW1D   Draw 1D Superposition of ER, E, and H
% draw1d(ER,E,H,dz)
draw1d(ER,E,dz)
% This function draws the dielectric materials and the fields on the same
% plot. ER is an array containing the dielectric constant at each point
% on the grid. E is the electric field at each point on the grid. H is
% the magnetic field at each point on the grid. dz is the grid resolution.

% DRAW2D   Draw Field Superimposed on Materials for 2D FDTD
% h = draw2d(xa,ya,ER,E,NPML)
h = draw2d(xa,ya,ER,E,NPML,OPTS)
% This MATLAB function superimposes the field on top of the materials
% and plots the image to the current axes. Further, it highlights the
% PML regions.
% INPUT ARGUMENTS
% ================
% xa, ya        Axis vectors listing the position of each cell in the grid
% ER            Permittivity function across the 2D grid
% E             The electric field across the 2D grid
% NPML          [xlo xhi ylo yhi] size of the PML
% OPTS          Options (Optional)
%   .emax       maximum value of the electric field
%   .cmap       custom colormap
%                USA, Mexico, or any MATLAB colormap
%                could also be a Nx3 array for custom colormap
%   .NCOL       number of shades of color (default 64)
% OUTPUT ARGUMENTS
% ================
% h             Handle to the plot

% POLYFILL    Fill 2D Grid with a Polygon
% A = polyfill(xa,ya,P);
% xa, ya       Grid Axes for the Array A
% P            List of vertices for the polygon
% [ x1 x2 ... xN ;
%   y1 y2 ... yN ];   N vertices
% A            2D array with polygon filled
% Note: The list of points P should progress CCW around the polygon.
% If the points are listed in reverse order, the outside of
% the polygon will be filled.