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%MODIFY this according to your file system setup workingfolder = 'D:\Dropbox\Projet Julien
Quentin\Physique Numérique\Exercice 6, Electrostatique\Quentin\ElementsFinis'; %full path to
the folder that contains the binary of the code and the simulations (must end with /) binfilename
= 'ElementsFinisStudents2.exe'; ndigit = 12; %precision used in num to str conversion for input
data file %Choose wat do % 1 plot some shit % 2 plot convergence trivial % 3
epsilon0=8.854187e-12; watdo=1; %MODIFY this according to your needs. %NB: scanned
parameter must always be the first in these lines. %dt = [0.00001:0.0001:0.01] %dt = 0.001;
%N1 = [10:10:1000]; %here, scan on dt, other parameters are kept constant. N1=1000; nsimul =
length( N1 ); %number of points in the scan. %N2 = repmat( 40, 1, nsimul); %replicate the value
to match the length of the vector dt. trivial = repmat( 0, 1, nsimul); infilename = { 'N1' };
%variable whose value will be included in the simulation file name inputparam = [ trivial; N1; N1
]; %order MATTERS! (see expected order in .cpp file)
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% %Simulations
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% %NB: DO NOT MODIFY THIS (unless you really want to...)
fnameinput_list = cell( 1, nsimul ); %init empty list fnameoutput_list = cell( 1, nsimul ); %init
empty list phib=[]; Eb=[]; DiffDrho=[]; Emoyen=[]; for ii = 1 : nsimul %loop on scanned parameter
%create the file name filename = ""; %init for jj = 1 : length( infilename ) %loop on infilename.
Build the string with _NameValue filename = [ filename, '_', infilename{ jj }, num2str( eval( [
infilename{ jj }, '( ii )' ) ) ) ]; end filename = [ filename, '.dat' ]; %add suffix %store the input/output
file names fnameinput_list{ ii } = [ 'inp', filename ]; %add the prefix and store fnameoutput_list{ ii
} = [ 'out', filename ]; %add the prefix and store %create the input data file fid = fopen( [
workingfolder, fnameinput_list{ ii } ], 'wt' ); %create or overwrite (empty file, text mode) %fill the
file fprintf( fid, [ '%.', num2str( ndigit ), 'g\n' ], inputparam( :, ii ) ); fclose( fid ); fnameoutput_list{ ii
} %run the simulation %eval( [ '!', workingfolder, binfilename, ' < ', fnameinput_list{ ii }, ' > ',
fnameoutput_list{ ii } ] ); % On windows platforms, comment the previous line and uncomment
the following line. Execute the present script in the workingfolder directory. system(
[binfilename, ' < ', fnameinput_list{ ii }, ' > ', fnameoutput_list{ ii } ] ); disp( [ '!', binfilename, ' < ',
fnameinput_list{ ii }, ' > ', fnameoutput_list{ ii } ] ); end for ii = 1 : nsimul
filename=[fnameoutput_list{ ii } ] data = load( filename ); %watch out: {} for lists, [] for vectors
x=data(:,1); phi=data(:,2); x2=data(:,3); Ex=data(:,4); Dx=data(:,5); Xmidmid=data(:,6);
Rhocmp=data(:,7); dDx=data(:,8); epsr=data(:,9); polarisation=data(:,10); if(watdo==2) %
figure(1) % hold on % plot(x,abs(phi-(500.*x./3))) % set(gca,'fontsize',18) % xlabel('x [m]') %
ylabel('phi') % % figure(2) % hold on % plot(x,abs(Ex+500/3)) % set(gca,'fontsize',18) %
xlabel('x [m]') % ylabel('phi') phib(ii)=data(N1(1,ii)+1,2); Eb(ii)=data(N1(1,ii)+1,4); end
if(watdo==3) DiffDrho(ii)=max(abs(dDx-Rhocmp*epsilon0)); end if(watdo==4)
Emoyen(ii)=mean(Ex); end end if(watdo==1) figure hold on plot(x2,phi,'.') %plot(x,500/3.*x,'r')
line([0.01,0.01],[min(phi),max(phi)],'color','k','linestyle','--') set(gca,'fontsize',18) xlabel('x [m]')
ylabel('phi') figure hold on plot(x2,Ex,'.')
line([0.01,0.01],[min(Ex-10^-10),max(Ex+10^-10)],'color','k','linestyle','--') set(gca,'fontsize',18)
xlabel('x [m]') ylabel('Ex') figure hold on plot(x2,Dx,'.')
line([0.01,0.01],[min(Dx),max(Dx)],'color','k','linestyle','--') set(gca,'fontsize',18) xlabel('x [m]')
ylabel('Dx') figure hold on plot(Xmidmid,dDx,'.')
line([0.01,0.01],[min(dDx),max(dDx)],'color','k','linestyle','--') set(gca,'fontsize',18) xlabel('x [m]')
ylabel('dDx') figure hold on plot(Xmidmid,Rhocmp*epsilon0,'r.')
line([0.01,0.01],[min(dDx),max(dDx)],'color','k','linestyle','--') set(gca,'fontsize',18) xlabel('xmidmid
[m]') ylabel('dDx bleu and Rhocmp rouge') figure hold on

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plot(Xmidmid,abs(dDx-Rhocmp*epsilon0),'b.')
line([0.01,0.01],[0,max(abs(dDx-Rhocmp*epsilon0))],'color','k','linestyle','--') set(gca,'fontsize',18)
xlabel('xmidmid [m]') ylabel('différence dDx Rhocmp') figure hold on plot(x,epsr)
line([0.01,0.01],[min(epsr),max(epsr)],'color','k','linestyle','--') set(gca,'fontsize',18) xlabel('x [m]')
ylabel('epsilon r') figure hold on plot(x2,polarisation,'.')
line([0.01,0.01],[min(polarisation),max(polarisation)],'color','k','linestyle','--') set(gca,'fontsize',18)
xlabel('x [m]') ylabel('Pol') figure hold on [hAx,hLine1,hLine2] = plotyy(x,Rhocmp,x,epsr)
line([0.01,0.01],[min(polarisation),max(polarisation)],'color','k','linestyle','--') set(hAx,'fontsize',20)
xlabel('x[m]') ylabel(hAx(1),'\rho_{lib}') % left y-axis ylabel(hAx(2),'epsilon_r') % right y-axis end
if(watdo==2) xpoly=[phib(1,end-2) phib(1,end-1) phib(1,end)]; ypolx=[(1./N1(1,end-2)).^2
(1./N1(1,end-1)).^2 (1./N1(1,end)).^2]; pol=polyfit(ypolx,xpoly,1); phibanalytique=polyval(pol,0);
figure hold on plot(1./N1,100*abs((phib-phibanalytique)/phibanalytique),'.') plot(1./N1,1./N1.^2*6)
set(gca,'fontsize',18) xlabel('1/N1') ylabel('Pourcentage derreur sur \phi') figure hold on
plot(N1,phib) set(gca,'fontsize',18) xlabel('N1') ylabel('\phi(b)') xpoly=[Eb(1,end-2) Eb(1,end-1)
Eb(1,end)]; ypolx=[(1./N1(1,end-2)) (1./N1(1,end-1)) (1./N1(1,end))]; pol=polyfit(ypolx,xpoly,1);
Ebanalytique=polyval(pol,0); figure hold on
plot(1./N1,100*abs((Eb-Ebanalytique)/Ebanalytique),'.') plot(1./N1,1./N1*1.5*10^2)
set(gca,'fontsize',18) xlabel('1/N1') ylabel('Pourcentage derreur sur E') figure hold on plot(N1,Eb)
set(gca,'fontsize',18) xlabel('N1') ylabel('E(b)') end if(watdo==3) figure hold on
plot(N1,DiffDrho,'b.') set(gca,'fontsize',18) xlabel('N1 [m]') ylabel('différence dDx Rhocmp') end
if(watdo==4) figure hold on plot(N1,abs(Emoyen+500/3),'b.') set(gca,'fontsize',18) xlabel('N1
[m]') ylabel('Emoyen') end

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