Read the two Lab files from today. I will finish them off next class.

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The file “synth\_seis.f“ has the FORTRAN program from the textbook Stein and Wysession - Introduction to Seismology, Earthquakes and Earth Structure, with a few minor changes.

Download this file and run the program. Since this is a FORTRAN program it will take several steps to do this that are explained here.

After downloading the FORTRAN file run the following from a terminal window on the Mac

(if this makes no sense – just double click on the icon that looks like this )

Once there type the following at the prompt (you type the stuff in *italics*, the computer’s outputs are not italicized and bold, the $ is the prompt in this example.)

**$** *gfortran –o synth\_seis synth\_seis.f*

**$** *synth\_seis*

it should print out the following

**$** *synth\_seis*

**synthetic seismogram for string**

**number of modes 200**

**length (m) 1.000 velocity (m/s) 1.000**

**position (m) source 0.200 receiver 0.700**

**seismogram duration (s) 1.250 100 time steps**

**source shape term 0.020**

It will also have made a file “seism.dat“ whose existence you can check by typing

**$** *ls seism.dat*

**seism.dat**

If you can’t do the above in 10 minutes come see me.

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Next download the Matlab m-file “synth\_seis\_fort\_xlate.m” in the link.

Run this in MATLAB and plot it – the time data in is a vector t and the seismogram is in a vector u, both 1 x 100.

Load in the file from FORTAN using this MATLAB command

load(‘seism.dat’)

You will now have a new variable called seism that is 100x2. Note that this is transposed with respect to t and u. We will need to remember this later.

Now plot the FORTRAN output on the same plot. To do this you will need to tell MATLAB to not erase the existing plot and make a new one – this is done with “hold on”

Then plot the FORTAN output as red dots

plot(seism(:,1),seism(:,2),'r.')

or

plot(t,seism(:,2),'r.')

since seism(:,1) and t both have the time in them and the times are the same for both.

(if you just plotted it as a line you would only see one line as they overlay one another very well.)

Finally, plot the difference between the calculations. Start a new figure using the “figure” command.

Here we have to take into account that the two seismograms are transposes (else it makes a matrix!)

So you want to plot “seism(:,2)'-u“ against time. You should see that they agree to 1e-5.

If you can’t do the above in 15 minutes come see me.