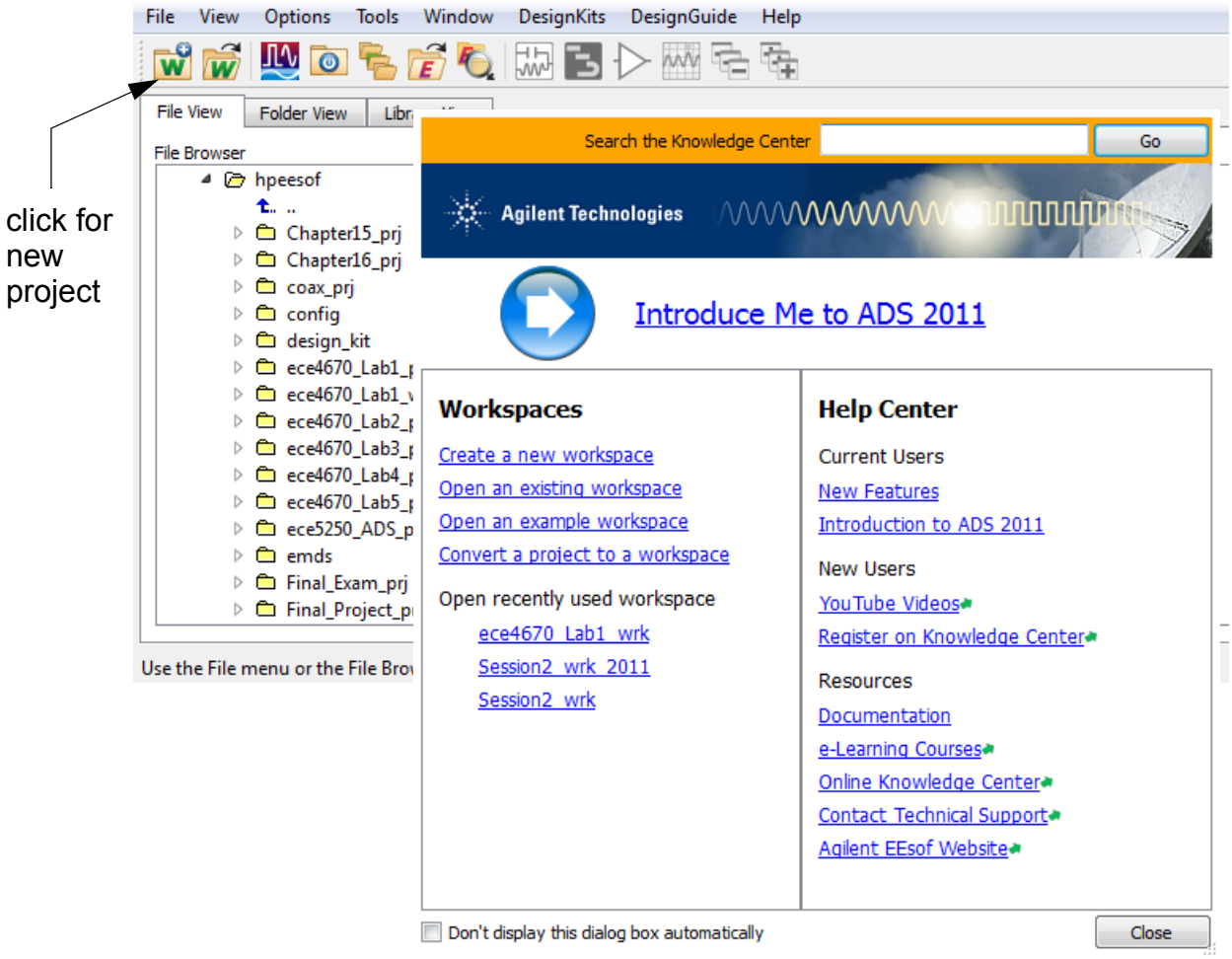
First Steps with ADS

ADS Session 1

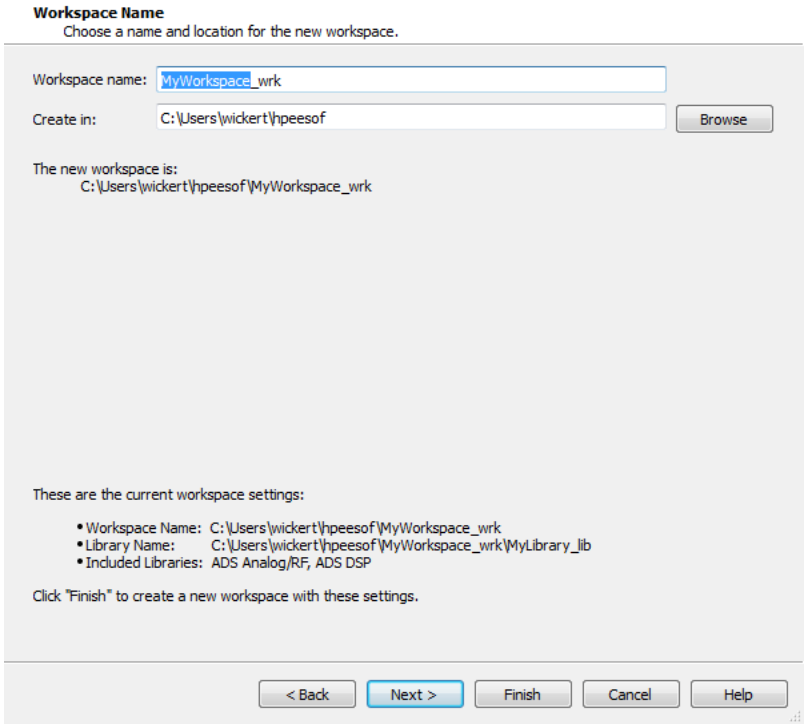
Start ADS and Create an Empty Project

- Look for a desktop icon or start menu item entitled Advanced Design System 2011
- ADS will start up and you will see ultimately:



- Close the getting started with ADS dialog box, and create a new workspace by clicking on the indicated button bar 'folder icon'
- Click 'next' to bring up the Workspace Name dialog

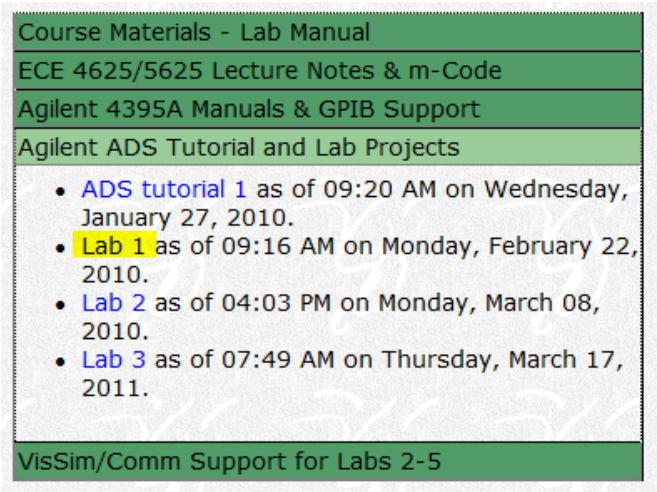
- Give the workspace a name and note where it is being placed so you can find it again later



  – ADS creates a folder structure for each workspace
  – Each project holds a variety of file types placed in the sub-folders accordingly
  – For example, you can have many schematic files, plot files, and layout files all within a single workspace
- If a workspace was already open, ADS will ask you save it and then close it
- A sample workspace, `ece467_Lab1_wrk`, has already

been created and is available on the ECE4670 Web Site:

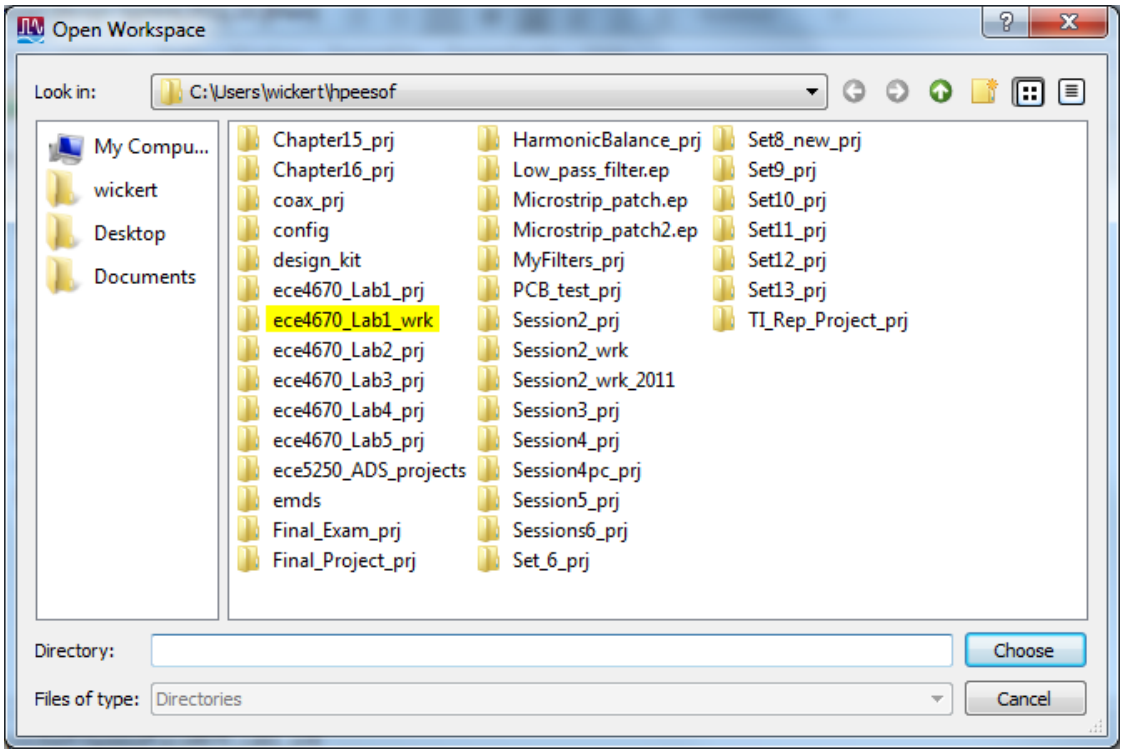
From http://www.eas.uccs.edu/wickert/ece4670/



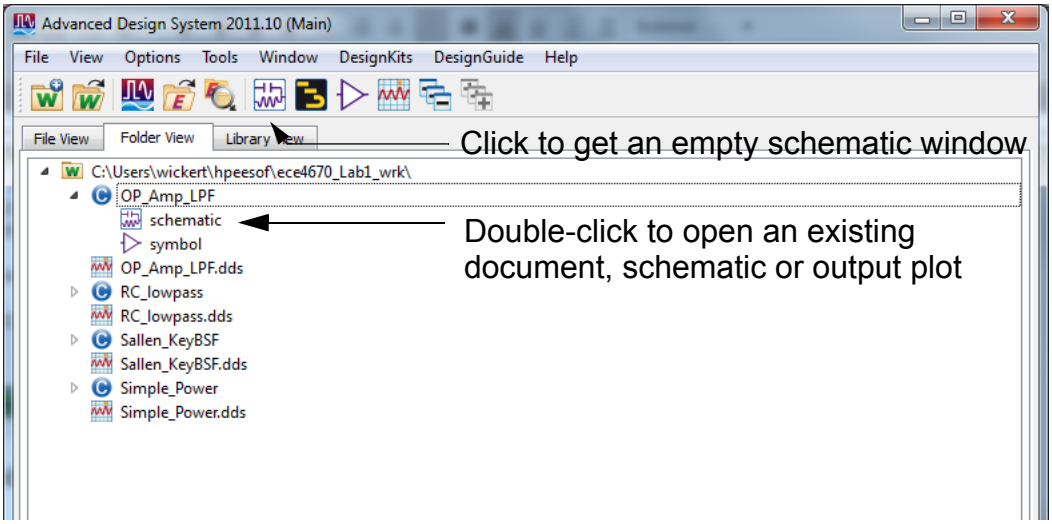
- Un-zip this into your user `\hpeesof` project folder

Working with ece467_Lab1_wrk

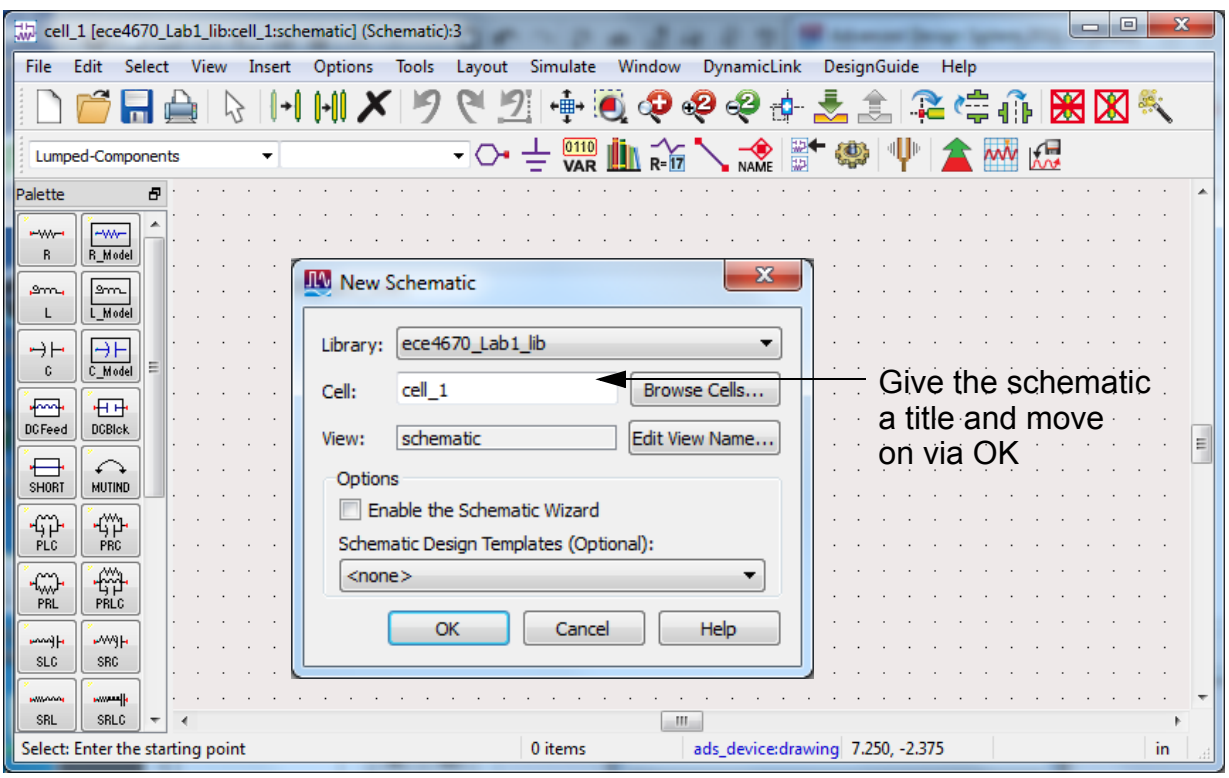
- Then from the ADS main/project window double-click this project to open it



- Once open the workspace will contain four schematics and four output files

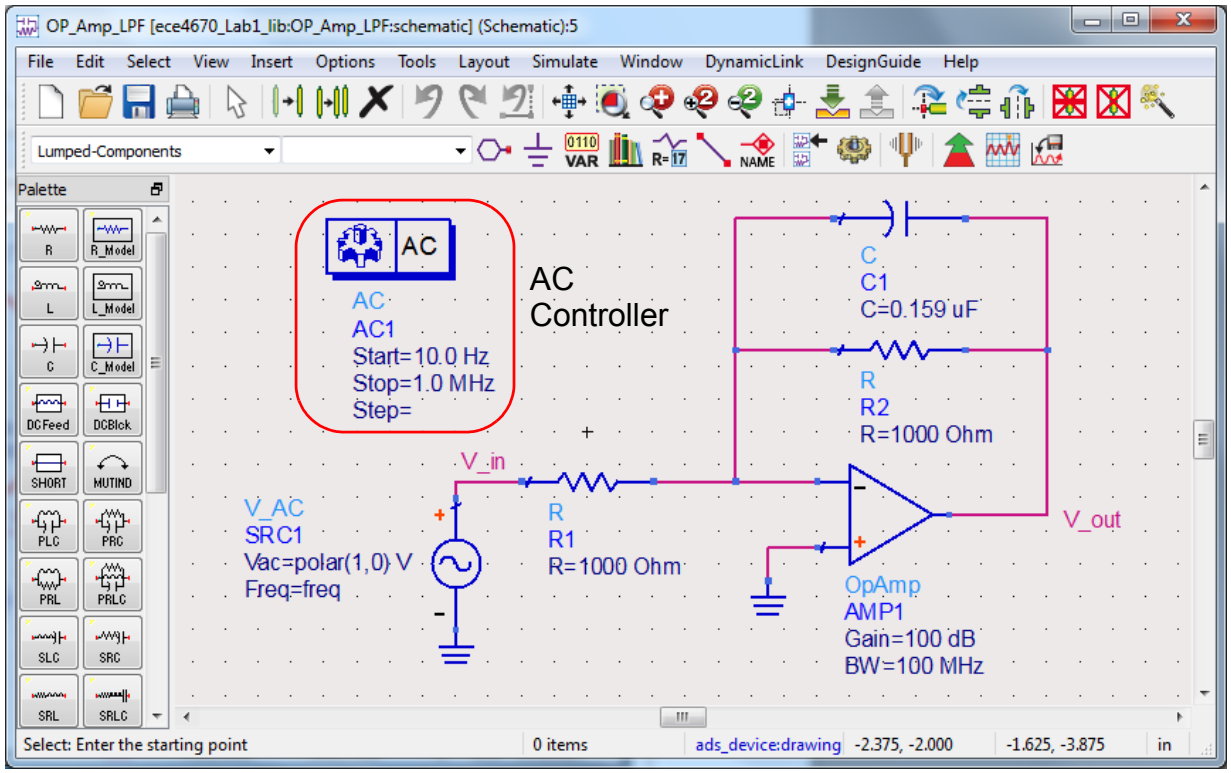


- When you click new schematic you can title in the cell field then click OK



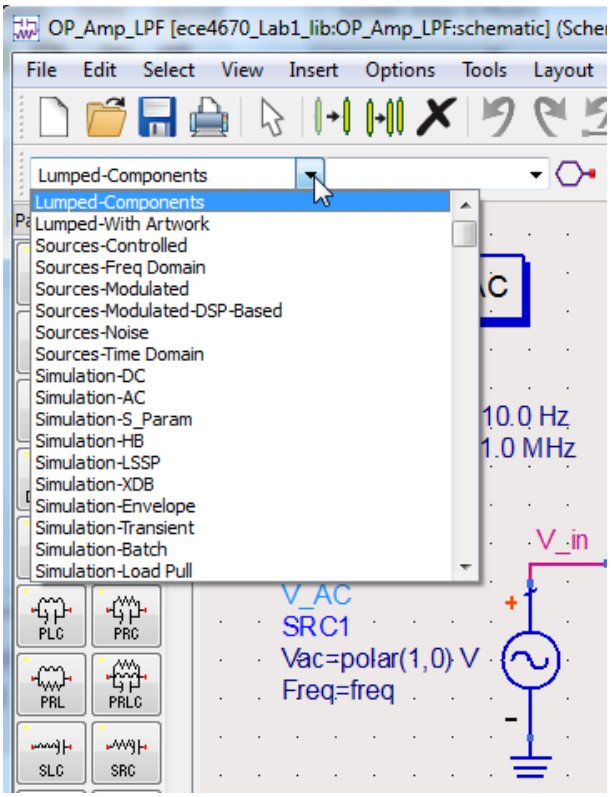
- At this point open the particular schematic under the cell `OP_Amp_LPF`

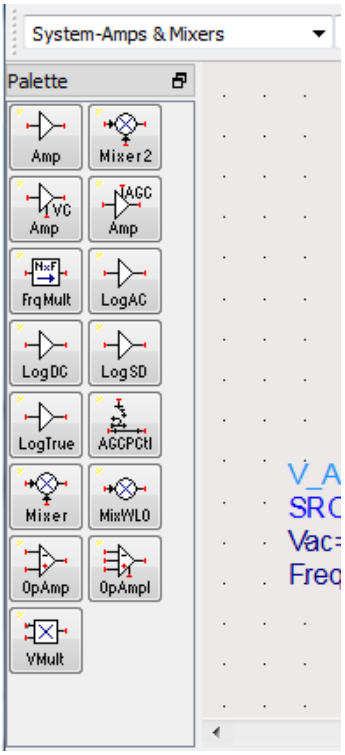
- This schematic is set up to perform an AC analysis of an active lowpass filter
- ADS has a number of controller blocks that are used to perform a given simulation type
- Here we have used an *AC controller*



- Other components have been brought onto the schematic too, including an AC source, resistors, grounds, an OpAmp, and a capacitor
  - To place a component click on it in the palette and then move the cursor over the schematic and click again where you want to place it
  - The cursor stays *loaded* with the same component until you hit the `esc` key

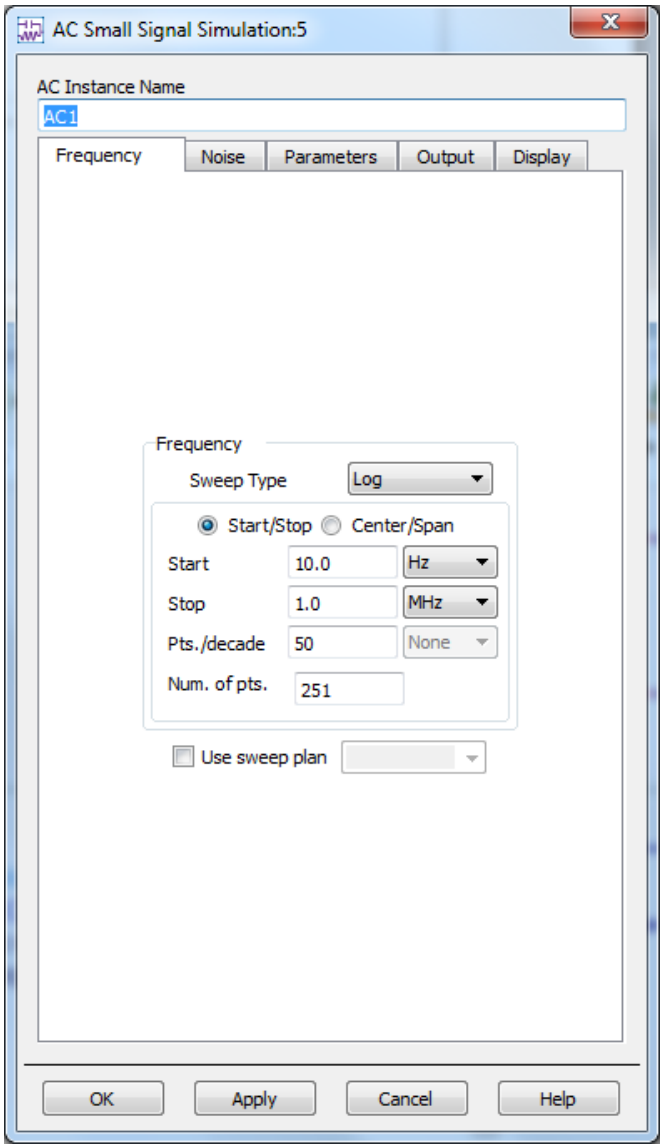
- All devices related to a simulation are brought from the palette docked at the left side of the schematic window
  - In the figure above a portion of the Lumped-Components palette is visible
  - Other palettes can be selected from the pull-down just above devices palette





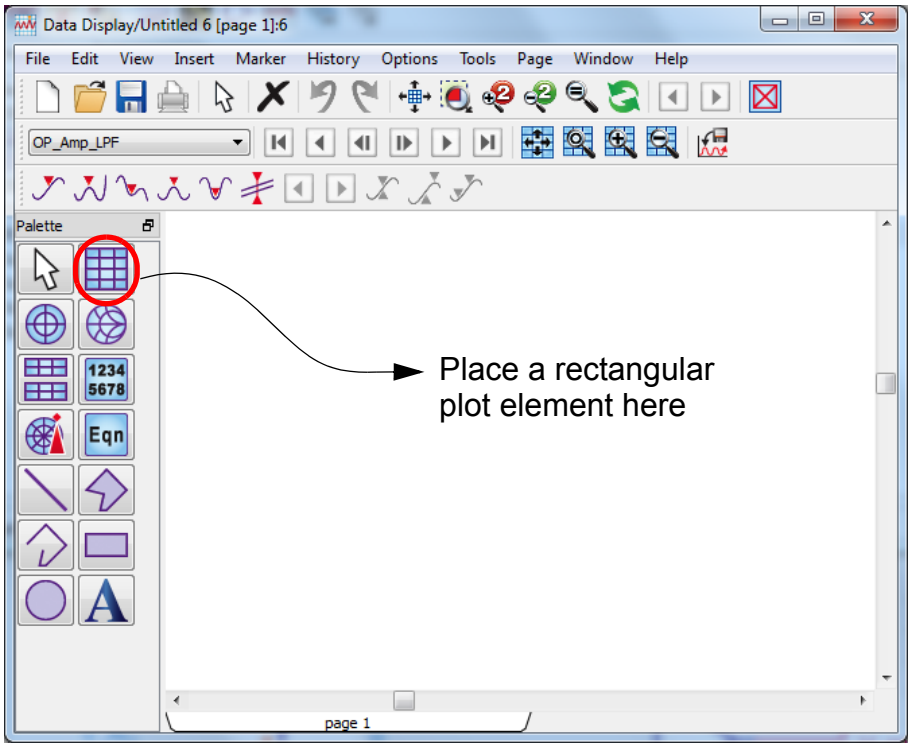
  - The OpAmp for example can be found under the System-Amps & Mixers palette
- You can add wires to the schematic by clicking on the wire button or using crl-w (always use `esc` to escape from a particular place or edit mode)

- The last step in the schematic is to configure the AC controller

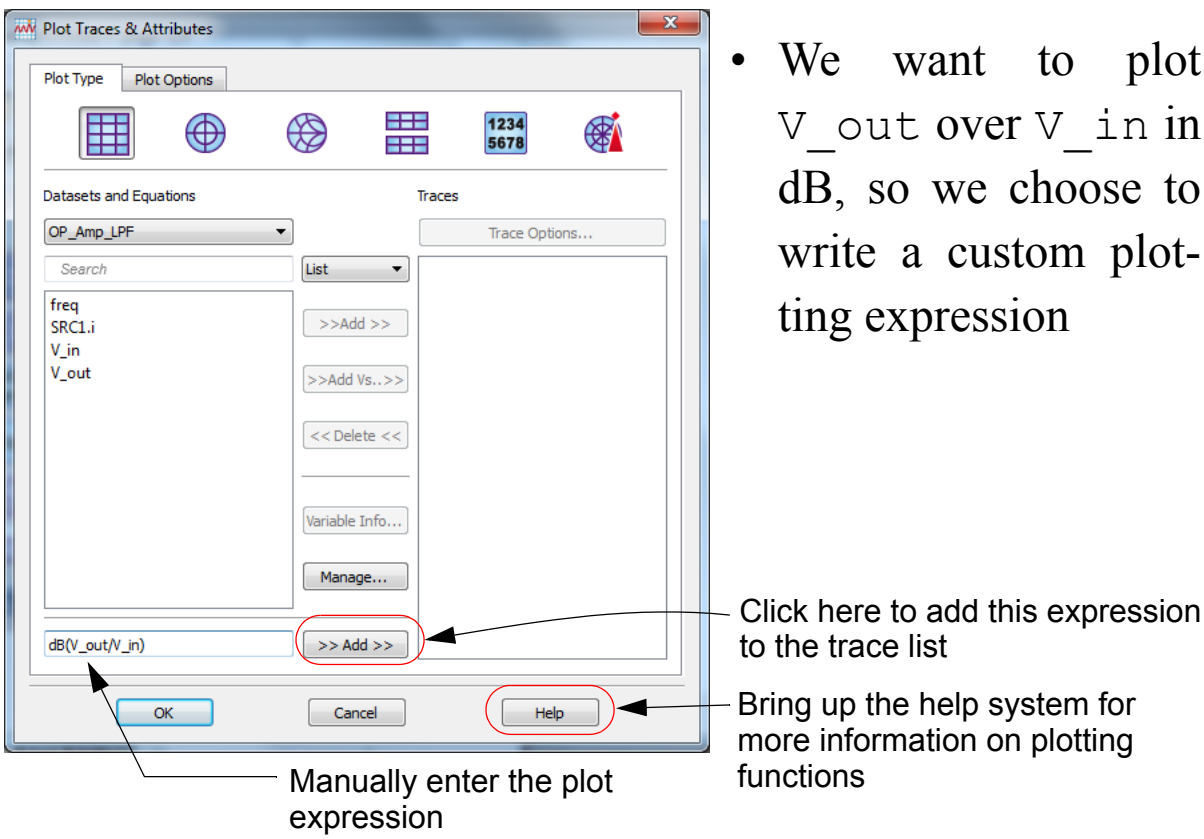


  - Here we have set up a log sweep from 10 Hz to 1 MHz with 50 points per decade
  - New we can run the simulation by clicking the shaped button

- If all goes well, that is no error messages, a plot window will open

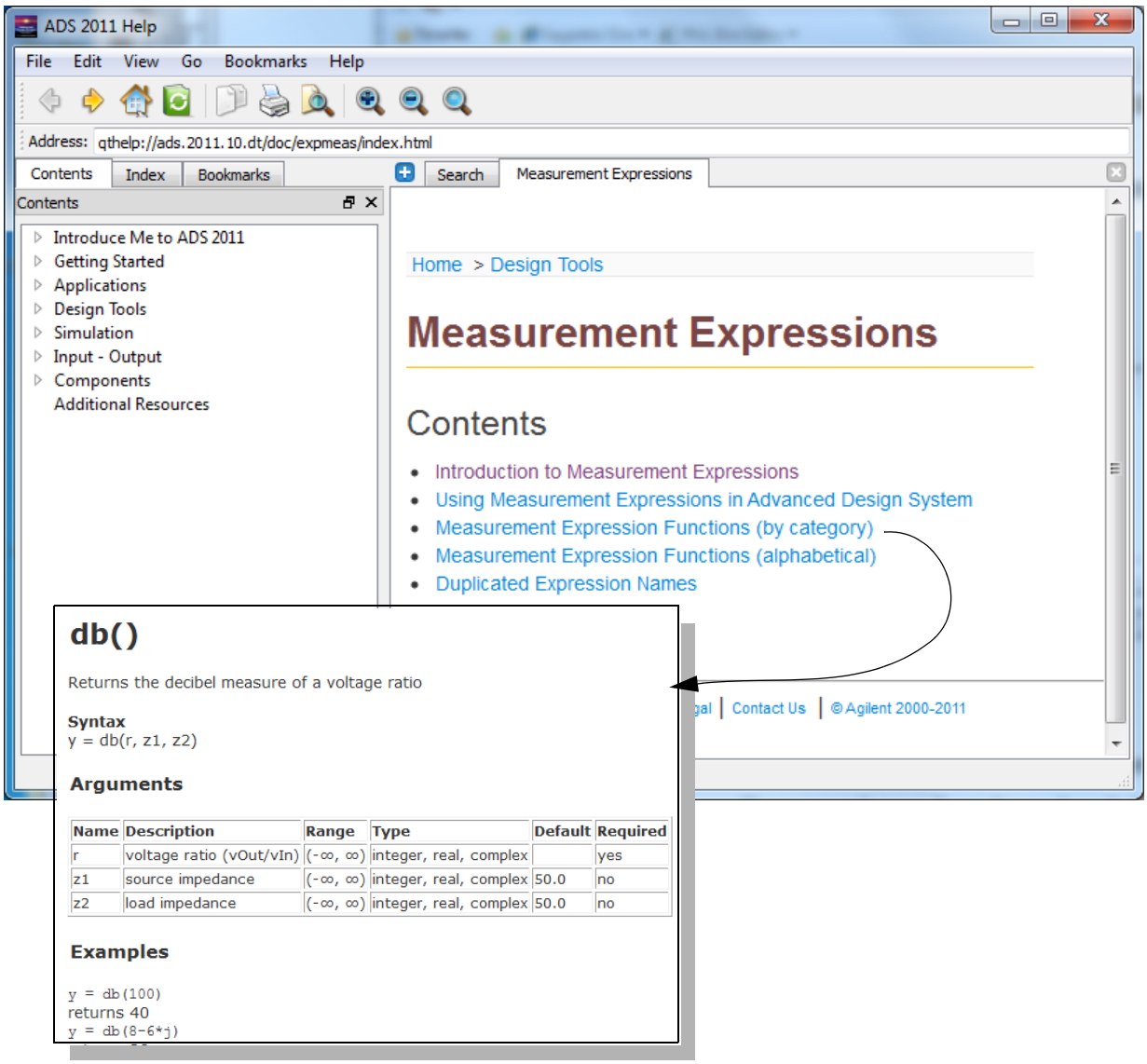


- You now place a rectangular plot element on the plot window and configure it as shown below

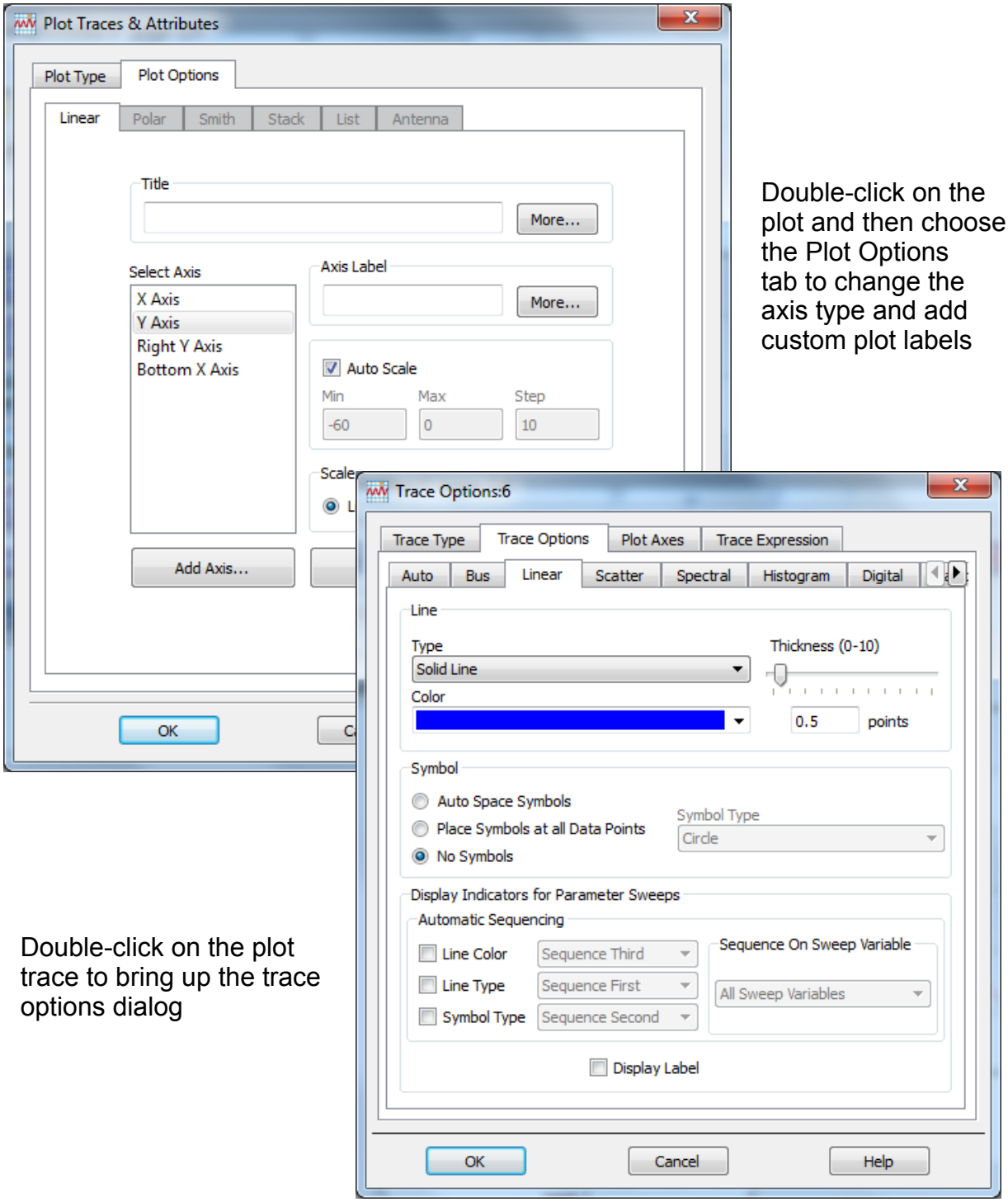


- We want to plot `V_out` over `V_in` in dB, so we choose to write a custom plotting expression

- The available functions can be found by clicking Help



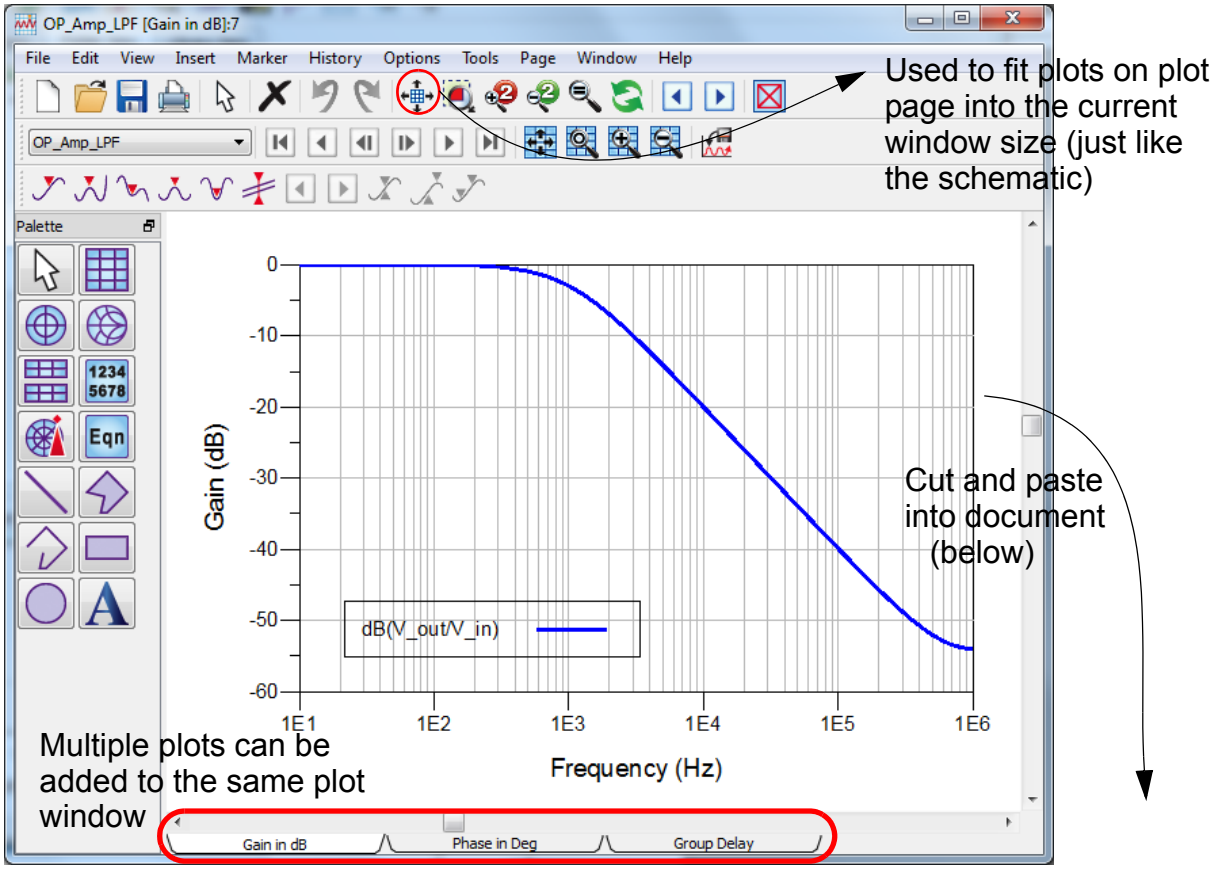
- You can later configure the plot by double-clicking on the plot element to make the x-axis log and change scales, colors, etc, etc...



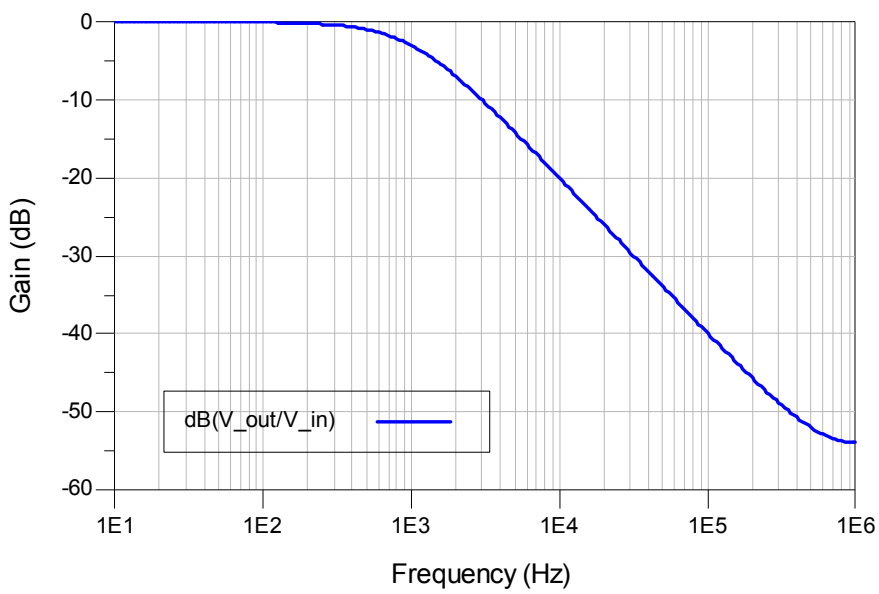
Double-click on the plot and then choose the Plot Options tab to change the axis type and add custom plot labels

Double-click on the plot trace to bring up the trace options dialog

- The final result is shown below as a screen capture, and then as a plot cut and pasted into this document



- You should save your plot window as it will be saved into the project along with the schematic (`*.dds` file in workspace)



- If you run the simulation again, with different settings, the

plot window update

- Each page of a plot window can contain multiple plots of various types, and each plot window can contain multiple tabbed pages, (nice!)
- You can put markers on your plots similar to the way markers work on spectrum and network analyzers in the lab

Summary

- We have just scratched the surface of ADS at this point
- There are 13 total controller blocks available for running simulations
- There are communications and DSP specific blocks
- ADS is very strong in modeling radio frequency/microwave circuits
  - There is a 2.5D electromagnetic field (EM) simulator
  - A 3D field simulator (EM Pro) for antennas & structures
  - There is a layout editor for PCBs and more...
- Stay tuned for more