Chapter 1

Getting Started
PathWave Advanced Design System (ADS)

This tutorial will introduce the basic structure of PathWave ADS workspaces, libraries, and cells. This includes design capture, simulation, and displaying simulation results [1]. Figure 1 shows how PathWave ADS organizes each workspace.

Workspaces

Different than a project, a workspace give you access to libraries that contain cells, where the cells contain designs.

Libraries

In a workspace, libraries are a collection of cells. But libraries can also be Process Design Kits (PDKs) or separate folders outside of the workspace.

Cells

Cells are folders that replace design files in the old networks directory. Cells are in libraries and usually contain different views of a design - this means layouts, schematics, and a symbol.

Symbols

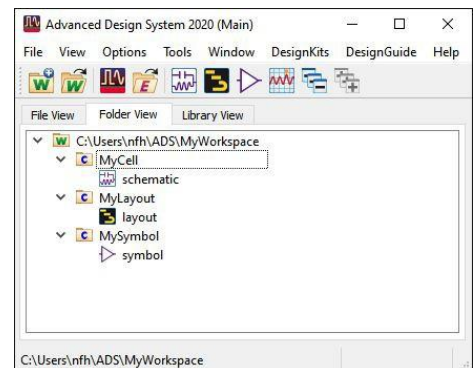The symbol represents all views in the cell. Usually one symbol is all you need for a cell. [2]

Figure 1. Workspace-Library Hierarchy

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1. Workspaces in ADS 2011 and later replace projects from earlier ADS versions.
2. Understanding these concepts is key to using ADS 2011 and later effectively.

Step 1 – Create a New Workspace

1. Launch PathWave ADS. In the main window select **File > New > Workspace**. Enter workspace name as desired in the dialog box shown in Figure 2. Please note that the workspace name and path [3] to the workspace location should not contain any spaces. If you want to make changes to your PathWave ADS libraries, click on the **Change Libraries…** button; the ADS Analog/RF and ADS DSP libraries are included by default. Once you are satisfied with your workspace name, path, and libraries, click **Create Workspace**.
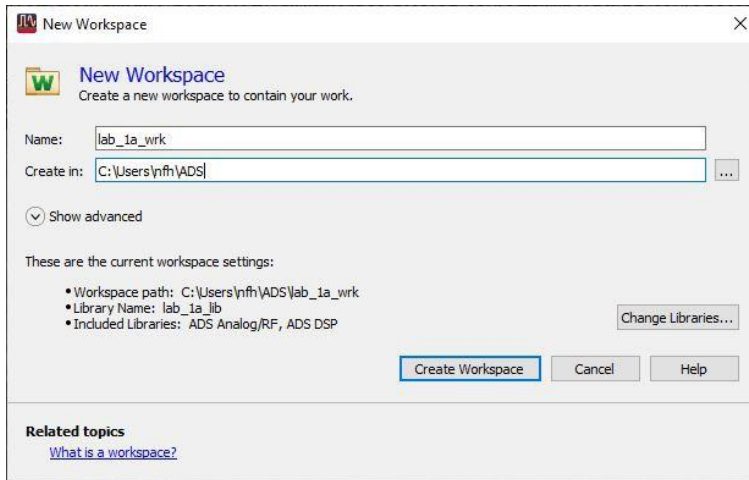

Figure 2. New Workspace Dialog Box

2. Once you complete the setup wizard, you will see the Main window, shown in Figure 3. This is where your PathWave ADS journey begins.
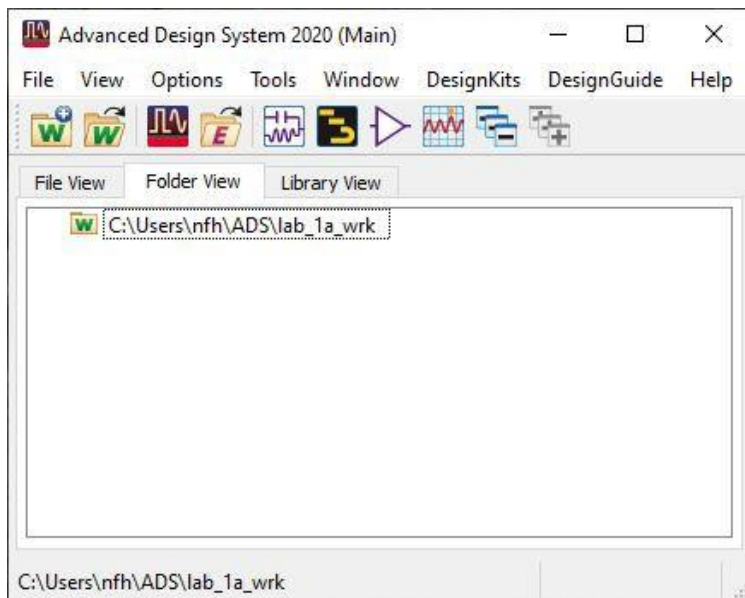

Figure 3. Main PathWave ADS Window

3. The default path in PathWave ADS is C:\Users\<Current_User>

Step 2 – Creating Schematic Design

Circuit design typically starts from schematic entry. To start the schematic design, select **File > New > Schematic** or by clicking on the Schematic icon on the main window toolbar.

1. Enter the desired cell name (e.g. DiscreteLPF). Click **Create Schematic**.
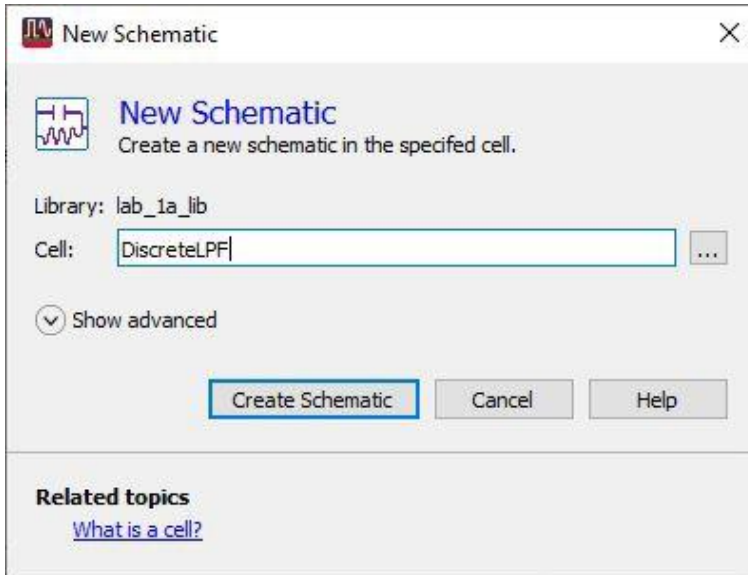

Figure 4. New Schematic Wizard

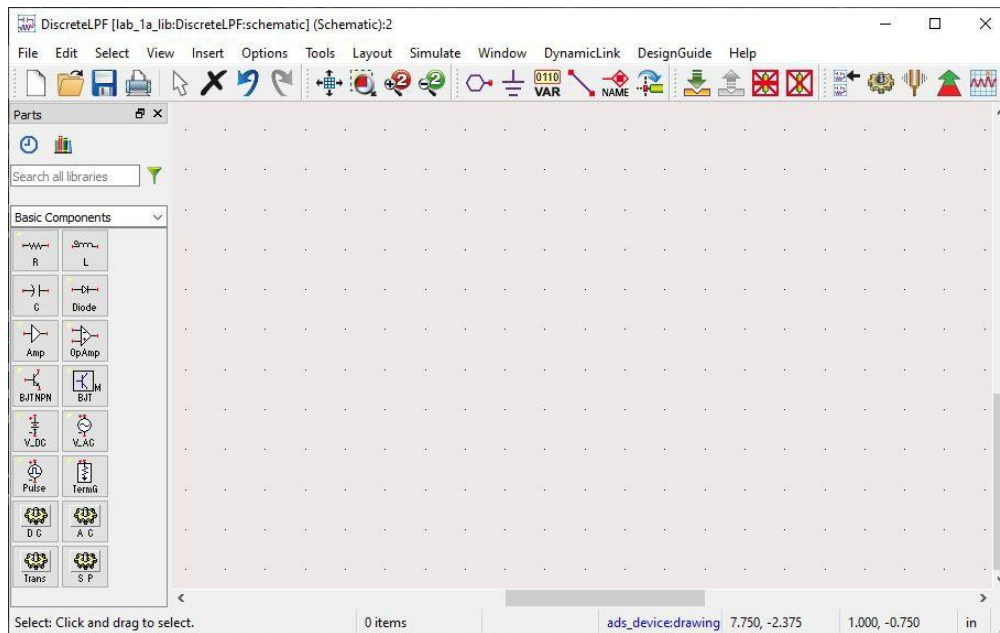2. A new blank schematic will be shown, as in Figure 5.

Figure 5. Blank Schematic Window

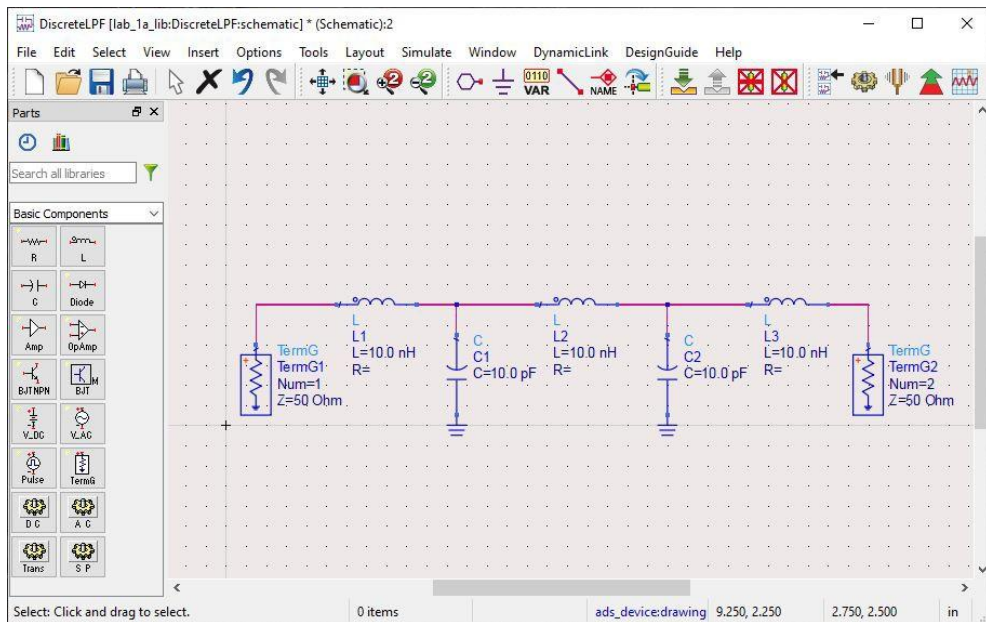3. Using the Basic Components, draw the schematic shown in Figure 6.

Figure 6. Completed Schematic

4. Using the SP block, or S Parameter component in the **Basic Components** menu, add the S_Parameters simulation object to your schematic, shown in Figure 7.

5. Double click the S_Parameters component, which will allow you to edit the parameters. The properties window, shown in Figure 8, will open. Set the following values:

> Start = 0.01 GHz
>
> Stop = 1 GHz
>
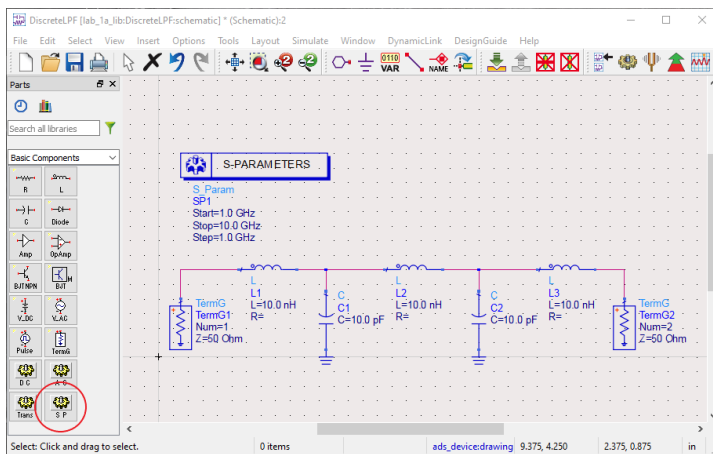> Num. of Points = 101

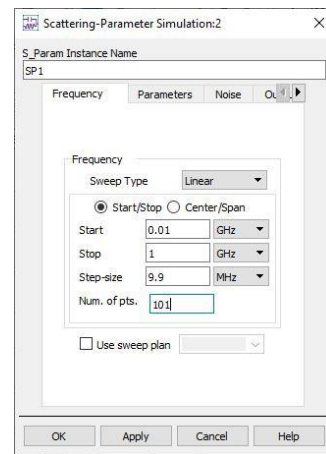Figure 7. Schematic with S-Parameters Simulation Object

Figure 8. S-Parameter Simulation

6. Once your simulation parameters are setup, got to **Simulate > Simulate,** or press **F7**, to run the simulation. You will be met with a blank simulation results page like in Figure 9.
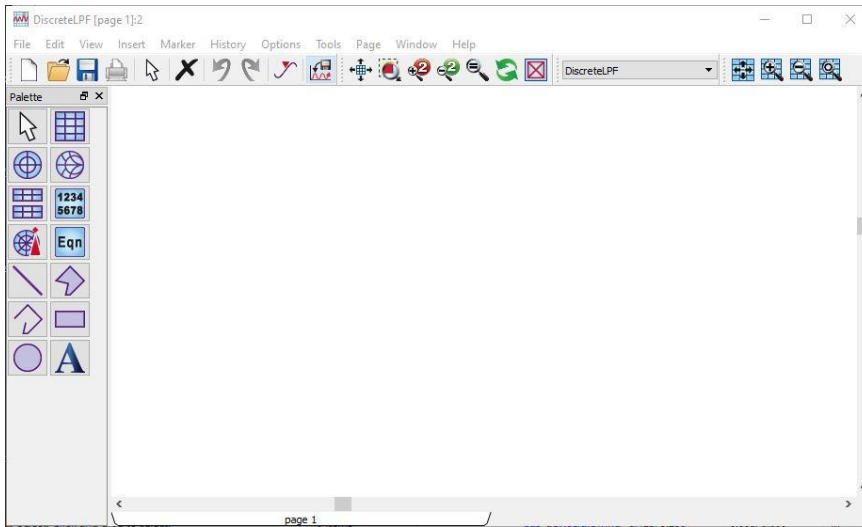

Figure 9. Blank Simulation Results Window

7. Using the buttons in the **Palette Menu** on the left, begin adding the desired graphs to the results window. In this case, we are going to add a Smith Chart for S(1,1), as shown in Figure 10. After clicking on the Smith Chart button, click anywhere in the white part of the results window to place the chart.
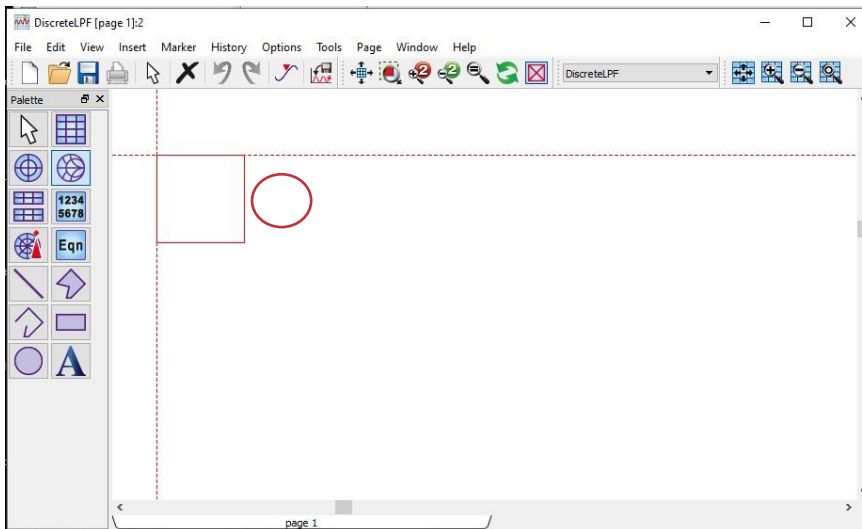

Figure 10. Inserting Smith Chart for S(1,1)

8. A dialog box will open that will allow you to add traces to the plot. Add the S(1,1) trace by selecting S(1,1) from the left side and clicking the **>>Add>>** button. This window is shown in Figure 11. Click **OK**.
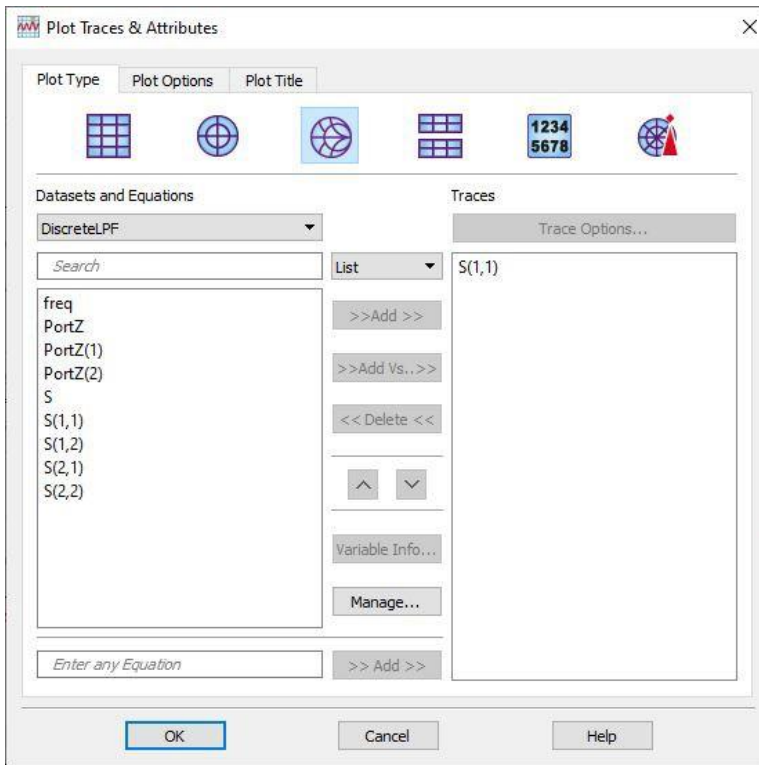

Figure 11. Adding S(1,1) Trace to Smith Chart

9. Next, using the **Text** tool, add the graph title. Since each results window may contain several graphs, lists, and equations, it is a good practice to label the different objects.
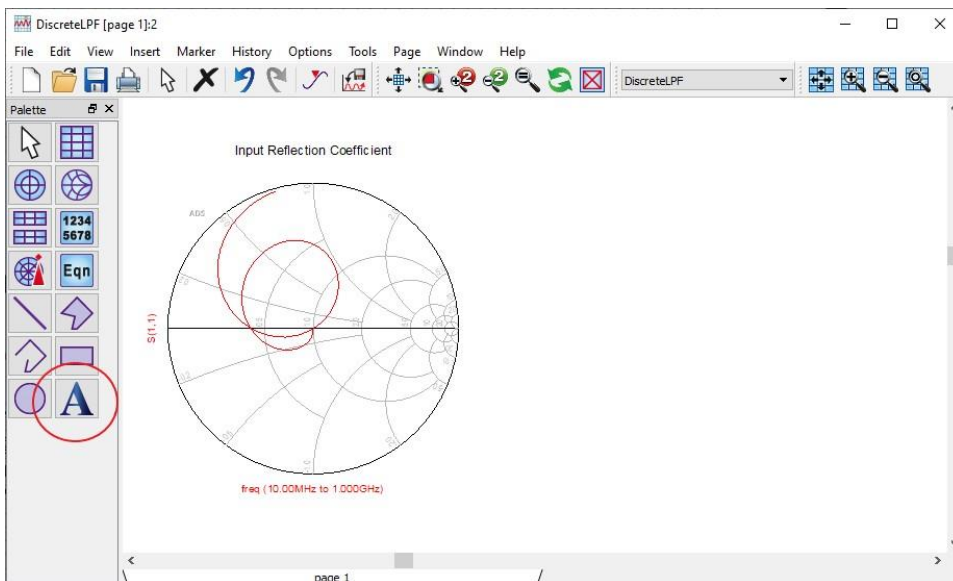

Figure 12. Results Window with Smith Chart

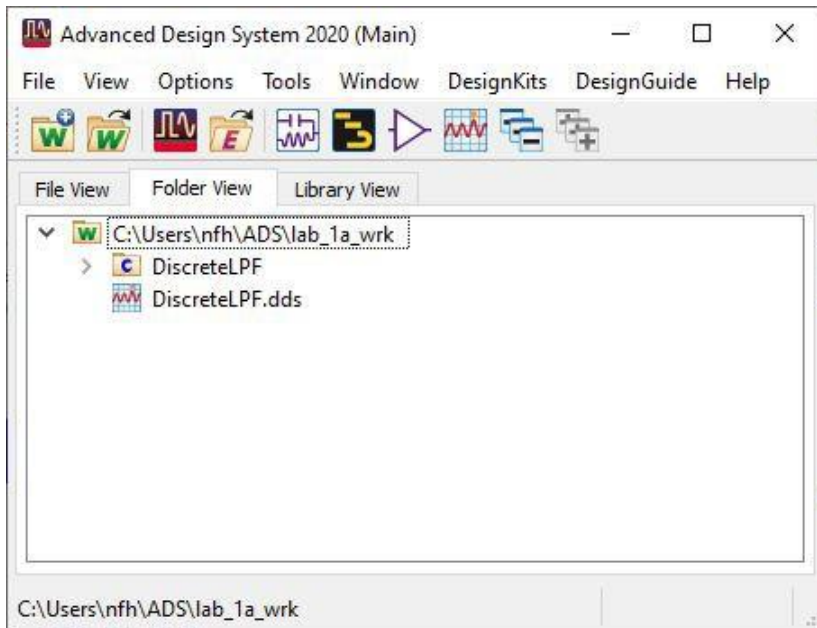10. Save the results and schematic. After close both windows, the main window should look like Figure 13.

Figure 13. PathWave ADS Main Window After Saving

Conclusion

Congratulations! You have completed Getting Started with PathWave Advanced Design System (ADS). Check out more examples at www.keysight.com/find/eesof-ads-rfmw-examples.

Learn more at: www.keysight.com

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