

Animations in Excel

Having had a data projector and whiteboard in my lab for the last year, one of the things I've found myself making most use of is animations. Some

are standard Java applets from the web, some are Modellus¹ models (standard and home-made) and some are Excel-based.

¹Modellus is freely available from <http://phoenix.sce.fct.unl.pt/modellus>

Excel is very well suited to plotting graphs with a very large number of points (such as a smooth wave) or graphs of complex mathematical functions—these are things Modelling does poorly. Hence I have used Excel for demonstrations of travelling and standing waves, AM and FM modulation, digitization and sampling. The key to these demonstrations is that Excel automatically replots a graph when a dependent cell is changed. If a graph of standing and travelling waves is produced from data which points to a single cell containing the time, then as the time is updated the waves will appear to move. But how to update the time smoothly and quickly? One way is to write a brief Visual Basic macro, but there is a simpler way.

First open a spreadsheet and select the View menu, then Toolbars and select the Control Toolbox (figure 1). From the control toolbox on the screen click the Spin Button (this looks like an upwards and downwards arrow). Click on the spreadsheet and the button appears. Right click the button on the spreadsheet and select properties. Now change the values of LinkedCell (the cell containing the time variable for example), Min and Max. Now click the Design Mode button (it looks like a set square and ruler). Now when you click on the spin button it should operate, increasing or decreasing the time. Holding down one arrow will speed through the allowed values quickly enough to animate a graph smoothly.



Figure 1. *The Control Toolbox in Excel.*

One drawback is that this method can only increase the time by an integer amount—so if you want to step by a smaller unit you need the time variable to be equal to the linked cell divided by some fixed value. For example, have the linked cell as A1 and able to vary from 0 to 100000, and make B1 contain a calculation “=A1/20”. Make your calculations point to B1. Now B1 steps by 0.05 each time A1 increases by 1.

If you don’t get any animation, check under Tools then Options. On the Calculate tab is an option for Automatic Recalculation—make sure that it is ticked.

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