Dual Display and Add/Subtract

This section describes how to display 2 spectra on the screen simultaneously (Dual Display) and how to add and subtract 2 spectra.

Show me how to use Add/Subtract.

DD -- Dual Display

Toggles dual display on and off. A spectrum must have previously been placed into the Add/Subtract buffer using the **AL** command. Dual Display is also available from the View menu. When DD is activated, the spectrum previously stored in the Add/Subtract buffer is displayed above the current spectrum. The spectra can be vertically scaled together in the same manner as for single spectra, and Zoom can be used for expansion. The spectrum in the DD buffer can be scaled by typing **AM**. This brings up a dialog box which allows a multiplying factor to be entered. Within this same dialog box, the horizontal and vertical offsets of the spectrum in the buffer can also be adjusted. Be careful to exit Zoom before executing this command, as NUTS will interpret DD as 2 baseline adjust operations.

AS -- Add/Subtract Subroutine

This is a subroutine which allows addition and subtraction of the current spectrum and a second spectrum which has been loaded into the add/subtract buffer. First, a spectrum (or FID) is loaded into the Add/Subtract buffer with the command **AL**. Then a second spectrum is opened with **GA**. Note that the spectrum in the buffer remains in the buffer and unchanged until another spectrum is loaded into the buffer with AL.

Typing **AS** or choosing Add/Subtract from the Tools menu enters the Add/Subtract subroutine. The menu choices change to those which are active in the subroutine. The spectrum in the buffer is displayed above the current spectrum. Subcommands within the subroutine are single letter commands executed immediately, and are available either from the keyboard or from the menus. Typing <Enter> exits the subroutine.

AS can be used in a link or macro, but behaves differently. In this case, the subroutine is not entered. Instead, addition of the buffer spectrum and the current spectrum is automatically executed without further input from the user.   The current value of the buffer multiplier (AM) is used. To perform subtraction, set **AM** to -1 before running the link or macro.

The spectra can be added or subtracted by typing + or **-**, respectively, or by choosing Add or Subtract from the Edit menu. The resulting spectrum (sum or difference) becomes the current spectrum. The spectrum in the buffer is unchanged. This operation can be un-done by executing the inverse operation.

The difference between the spectra (current spectrum minus buffer spectrum) can be displayed "on the fly" by typing **D** or by choosing Difference from the Display menu. With the difference spectrum displayed, parameters such as Multiplier and left/right offset can be adjusted and the difference spectrum is updated in real time to reflect the changes. Note that Difference mode affects display of the data.   Use - (minus sign) to make the subtraction permanent.

The buffer spectrum can be scaled by entering a multiplying factor. The initial value is one. It can be changed by typing **M** or choosing Change Multiplier from the Edit menu.

The buffer spectrum can be shifted left or right by one point using the left and right cursor keys. To shift it by larger steps, hold down the shift key while using the left and right cursor keys, which moves the buffer spectrum in steps of 10 points. The buffer spectrum can also be shifted by any desired amount by typing **O** or choosing Change Offset from the Edit menu, which brings up a dialog box allowing the user to set the offset (in points).

The vertical offset of the buffer spectrum can be adjusted by typing **V** or choosing Change Vertical Position from the Edit menu. The offset is expressed as a percentage of the screen, so that 10 displays the buffer spectrum 10% above the bottom. The vertical offset of the current spectrum can be changed by exiting the AS subroutine, typing **DC** and adjusting the offset using the left scroll bar. When the desired adjustment has been made, type Enter to exit the DC routine and re-enter the AS routine.

Subcommands

B -- Display Both buffer spectrum and current spectrum

D -- Display Difference between the spectra in real time (current spectrum minus buffer spectrum)

M -- Change Multiplier for buffer spectrum

O -- Change horizontal offset of buffer spectrum (in points)

S -- Display current Spectrum only

V -- Change Vertical offset of buffer spectrum

+ (plus sign)-- Add spectra and make resulting sum the current spectrum

- (minus sign) -- Subtract spectra and make resulting difference the current spectrum

Ctrl-C -- Copy screen to Windows clipboard as bitmap. See copying spectra.

Alt-C -- Copy screen to Windows clipboard as Metafile

AL -- Load Add/Subtract buffer

Places the current spectrum into the buffer.

AM -- Add/Subtract Multiplier

Enter the value by which the spectrum stored in the Add/Subtract buffer will be multiplied.

See also: Buffers subroutine