Customized data collection and handling at CHESS

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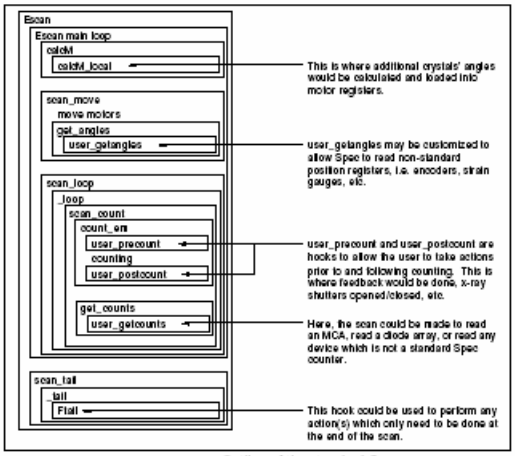
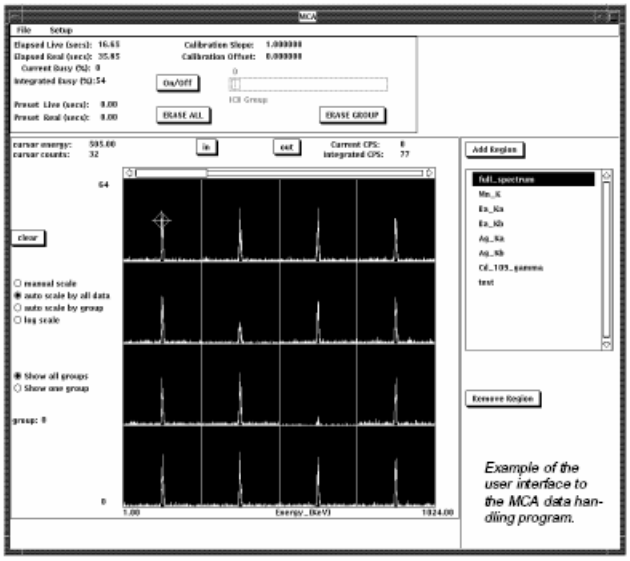
During the last CHESS undulator run, nearly all of the experiments required customization of some of the standard Spec scans in order to collect the necessary data. For example, the circular polarization optics experiment (see page 34) required an energy scan to move three crystals in synchronization with the monochromator. In fact, we implemented a routine that not only moved the crystals, but optimized the x-ray throughput of each element after each move. Also, to switch the left-right polarization, one crystal had to be moved over its rocking curve width at each point in the scan.

The brute force approach to accomplishing this would have involved making the standard "Escan" non-standard, with the cost of having to recreate and debug a large portion of the Spec software package. Luckily, the version of Spec now used in the lab provides a more efficient customization.

Shown schematically at right, each of the common scan macros makes a call to user-definable "hooks." A hook is a user-definable subroutine, normally having a null definition, but which can be made to take any action the user desires. This eliminates the need for duplicating entire scans, and allows the user to add only the minimum code necessary to customize the scan. Moreover, this method makes the alterations universally applicable, so that all scans may utilize them.



Outline of the standard Spec energy scan showing locations for user subroutines.



Example of the user interface to the MCA data handling program.

In another area of development, the MCA interface for the High-pressure facility has been vastly improved. The control panel now allows energy spectrum groups to be displayed simultaneously in individual "subwindows. This required the addition of new scaling options and increased software control. Another new feature provides a way to set which individual data group is monitored. And finally, the file output style was changed so that all groups could be written into a single datafile.

Documentation Helpscreens are now available at all the stations, encompassing most of the site-specific macros in general use at CHESS. Look in the CHESS help file for pointers to more information about specific macros.