

# INGASORT, A New Program For The Analysis Of Multi-Clover Array

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The data analysis program *NSCSORT* currently used for sorting data taken at Nuclear science Centre has been upgraded to analyse the data from multiple Clover detectors. The current version, called *INGASORT*, allow the analysis of data from up to 256 ADC's which can be projected into 256 spectra of size 8K each. A number of new commands have been added to facilitate speedy analysis of two, three and higher fold data from up to 24 Clover detectors. All these ADC's can be calibrated (in keV per channel) by using a single command (*GAIN*). In order to improve the energy calibration over an extended dynamic range, a cubic and a square route term has been added in the auto fitting algorithm. Some of the new Commands added are:

***CLOVER***: For the generation of Add-back spectra and provide polarisation information;

***DOALL***: This command sorts the data, after gain-matching, and stores the multiplicity, energy, time and hit pattern information from the clove detectors into an array. This array can be analysed by the following commands or can be saved in another list-mode data file for future analysis by using the command ***DUMP***.

***TRIPLES***: To unfold the spectra from three or higher fold events and to generate  $\gamma$ - $\gamma$  correlation matrix. A background subtraction algorithm has been added to remove the Compton background from the correlation matrix

***DCO***: Can generate unfolded DCO matrix from two or higher fold events.

A time window can be added to separate out the prompt and delayed events

**CUBE**: Can generate, for three and higher fold events, the two-dimensional correlation matrix with multiple energy gates on the third energy axis.

A number of auxiliary programmes have been added to work along with the program **INGASORT**. Some of these programmes are: **TDCAL** for matching the time peaks from various Clover combinations; **GAINMATCH** for automatic compensation of gain drift between different runs; **EFFICIENCY** for obtaining the efficiency curve from multiple source data and **PSREPLAY** to create PostScript plotter output. The command **PROJECT** is used for generating a background subtracted  $\gamma$ - $\gamma$  correlation matrix and gated projected spectra.

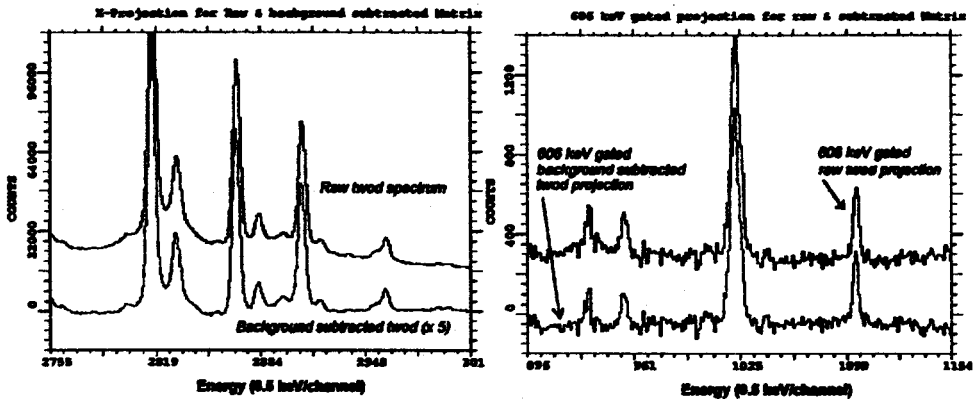


Fig 1 shows the effect of subtraction of a two-dimensional background from the raw gamma-gamma matrix. Since a large part of the photopeak in one detector is in coincidence with the Compton background in the second detector, there is a factor of five reduction in photopeak intensity in the x-projection (left panel). The actual intensity of photopeak vs photopeak coincidences however remains unchanged by this subtraction (right panel) although there is a significant reduction of background in this process.