

## MCA emulation on HYPERGAM

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### 1. Introduction

HYPERGAM, a new HPGe  $\gamma$ -ray spectrum analysis software, has been developed by Park et. al [1]. To use the HYPERGAM as an on-line spectrum acquisition and analysis software, which enables a spectrum analysis during data acquisition in addition to an off-line analysis, the MCA (Multi-Channel Analyzer) emulation function was added to control the spectrum acquisition device and to conduct reading out the data.

Although there are a few commercial programs such as GammaVision(ORTEC) and Genie 2000(CANBERRA) to control acquisition device, modification and improvement are not permitted to the programs for user's various and suitable purposes since the programs are not open. Therefore, the MCA emulation function was embodied to the HYPERGAM in C++ language based on the user's programming libraries provided by the vendors [2,3]. Hereby, detector control and spectrum read-out are possible by HYPERGAM and accordingly the analysis functions of it can be used in both online and offline.

### 2. Features

MCA emulation was embodied as the major commands of the 'start', 'stop', 'clear', 'conversion gain set' and 'time set' in control function part. In acquisition part, the spectrum data composed of two columns (channel and counts), data of live time and real time can be read-out.

Figure 1 shows the EtherNIM(ORTEC) emulation control and spectrum read-out running. Users can operate with button-click. The live time can be manually input and the conversion gain can be selected among the available setting given by the acquisition device. Spectrum data can be loaded from the memory of device

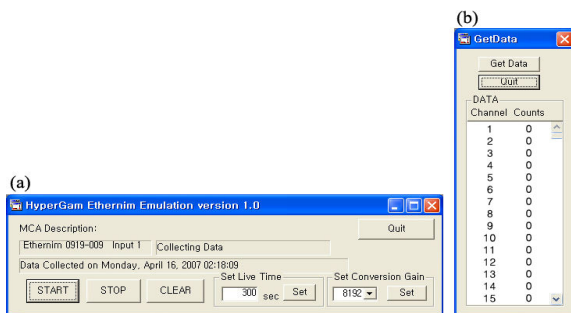


Figure 1. The control window of the EtherNIM emulation(a), and the data read-out window(b).

during or after the measurement and are saved as text file (\*.spe) of which format can be imported directly into the HYPERGAM.

Figure 2 shows AIM(CANBERRA) emulation control running sequentially. The process of conversion gain set, acquisition time set and time monitoring are displayed. The functions of the AIM emulation are equivalent with those of EtherNIM emulation while the operating interface is in DOS prompt type.

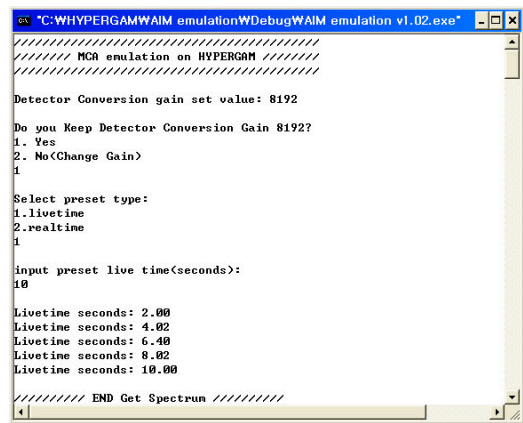


Figure 2. The processing window of the AIM emulation.

These functions were tested for the acquisition devices of ORTEC EtherNIM 919E, 921E model and CANBERRA AIM 556A model.

After developing the emulation functions, a simple kind of peak monitoring function is being developed for use in environmental radiation monitoring. The peak monitoring function is able to start measurement, analyze the region of interest in the spectrum and plot the results repeatedly. This is an advanced way of using MCS(Multi-Channel Scaling) combined with spectrum analysis. Hence users can monitor e.g. the fluctuation of area in interested region or the width of the selected peak in real-time.

### 3. Conclusion

MCA emulation function has been successfully added to HYPERGAM package and tested to control spectrum acquisition device and conduct data read-out. It is now possible to emulate the ORTEC and CANBERRA devices and to read out the spectrum data by HYPERGAM.

### ACKNOWLEDGEMENTS

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