

Revolution in Gamma Acquisition Systems: Costs and Benefits

For decades, gamma spectrometry data acquisition systems were based on analogue electronic modules. Developed at the beginning of the 1990s, digital data acquisition system democratized in the past 10 years. Since 2012 the R&D team in low level gamma spectrometry at CEA center of Bruyères-le-Châtel has started to use these systems. Digital electronics presents several advantages. First, all the required operations to record an event (filtering, amplification, time management, anti/coincidence ...) are performed in one single module whereas at least half a dozen of analogue NIM modules were needed previously. Then logical operations between channels are decided a posteriori where only a priori operations were possible before. And furthermore, a great improvement is the possibility to save the waveform of each incoming signal. Digital pulse shape analysis is a rather young but very promising discipline, which could allow automatic Compton background reduction, neutron/gamma discrimination, etc. In counterpart, this technology is rather young and several bugs or issues remain that do not exist with analogue electronics. Benefits and disadvantages of using both electronics for gamma-ray analysis will be presented.

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