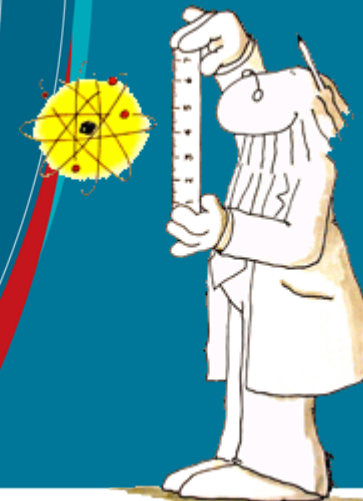


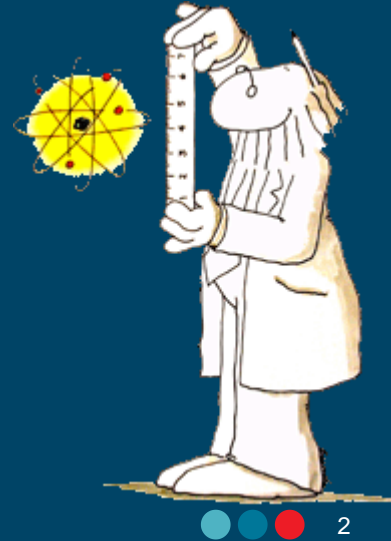
Overview of digitizers available at NRC

Raphael Galea

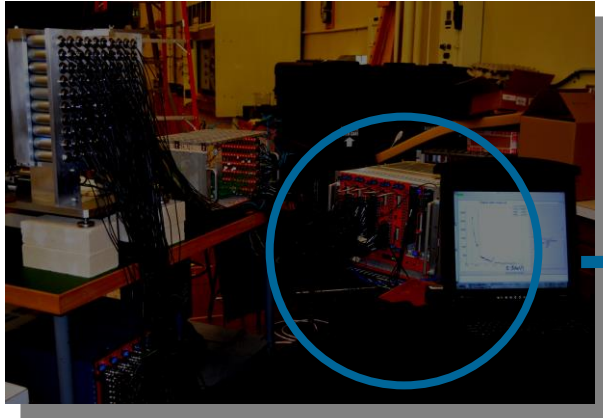
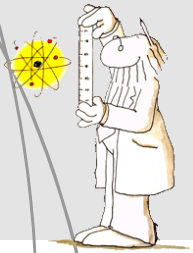
RMO-SIRTI workshop



I would like to begin by acknowledging that the NRC has offices across the country which are located on unceded, shared, current and traditional territories of Indigenous peoples. The land upon which I live and work is on the traditional unceded territory of the Algonquin Anishinaabe people. I recognize my privilege to be able to conduct research here and I pay respect to the peoples who were here long before us. It is our responsibility, in the spirit of reconciliation, to improve our understanding of and relationships with local Indigenous communities and their cultures.

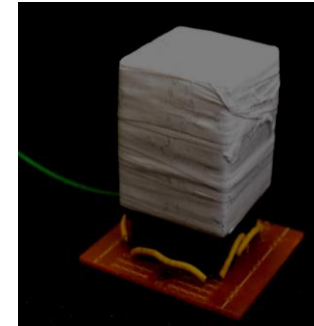
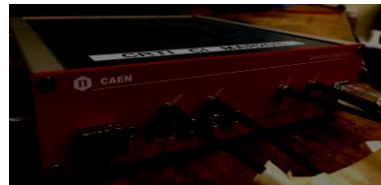


Compton Imaging : Audrey Macleod



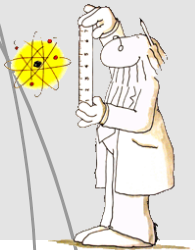
Digitizer Inventory

- 5 x 64-channel V1740 VME digitizers (CAEN)
- 2 x 64-channel V2740B VME digitizers (CAEN) with plans to buy 3 more
- 4-channel CAEN DTS 724 desktop digitizer



CAEN desktop digitizer for testing individual CsI scintillator+ SiPMs

Radionuclide metrology: Raphael Galea



$4\pi\beta\gamma$ coincidence counting

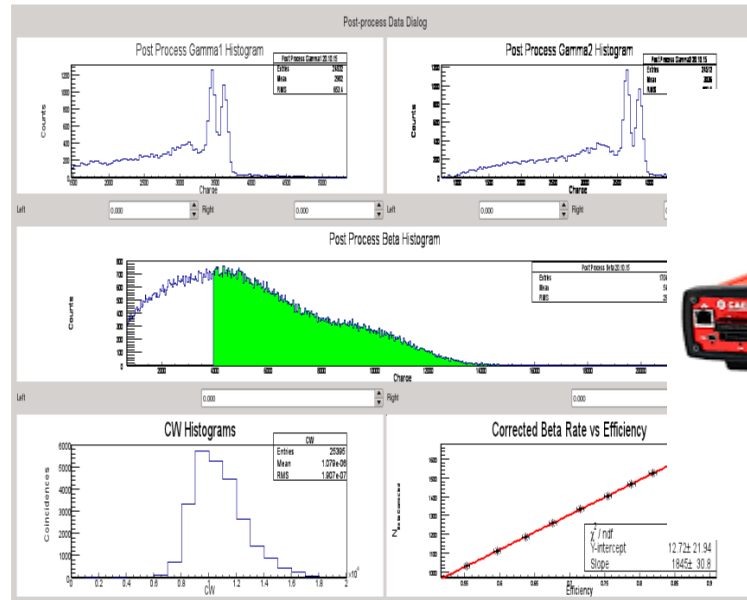
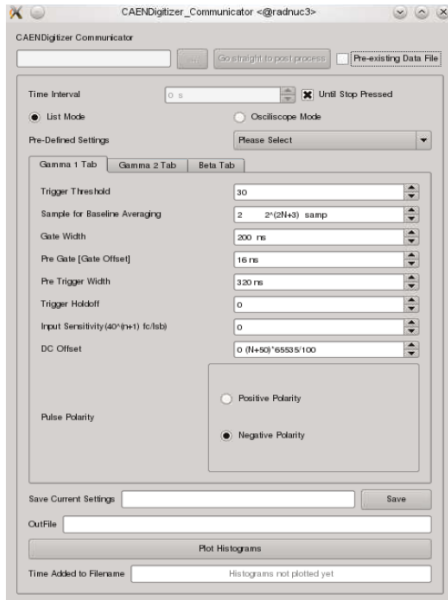
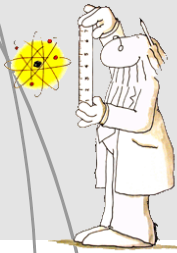
- N6720: DPP-CI (now no longer supported)
- DT5495 with scaler boards (FPGA available) used to digitize old NRC in-house built coincidence NIM modules
- NI-PCI-7831R initially purchased to copy NIST-TDCR DAQ but never developed



TDCR

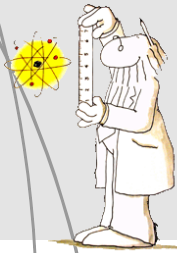
- DT5751: DPP-PSD

Radionuclide metrology: Raphael Galea



TDCR

- DT5751: DPP-PSD



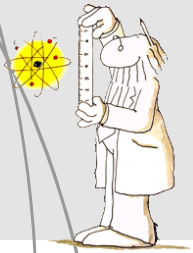
Internal gas counting: James Renaud

Trying 2 CAEN digitizers:

- N6725S : DPP-PHA
- DT5781 : DPP-PHA
- Lots of electronic noise
- Currently DAQ uses commercial CoMPASS CAEN software for list-mode output

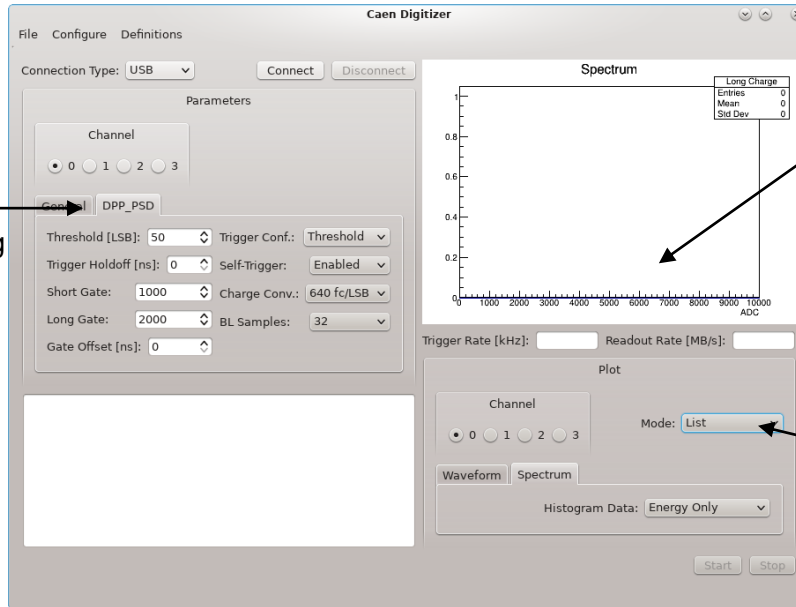


Neutrons: JP Archambault



- Initially a learning project for NRC Mn Bath

Control of signal processing



ROOT Canvas with Histogram
Ability to view spectrum or waveform

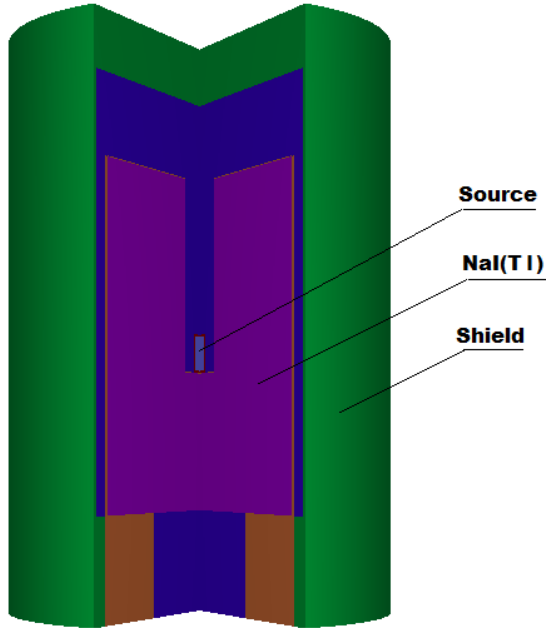
Qt interface for CAEN Digitizer (DT5720B)

Modes:
List
Oscilloscope

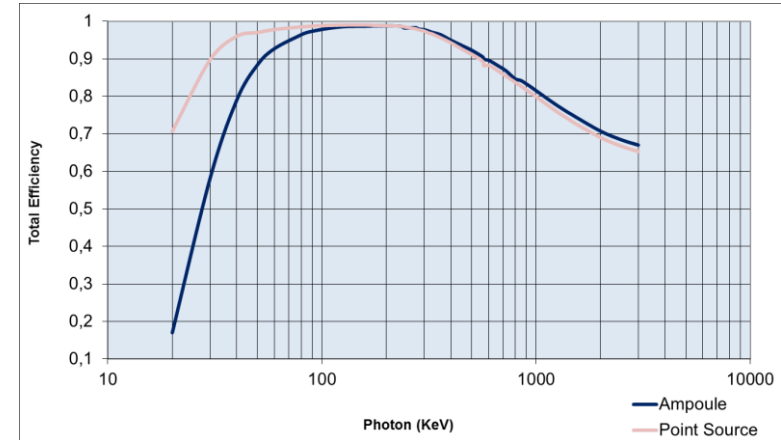
- Currently tested using signal generator for input
- Need** to implement write-out and offline analysis



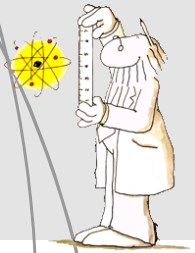
THE LMR-CNEA DIGITAL 4π_γ SYSTEM WITH A NaI WELL-TYPE DETECTOR



- The system is made up of a 17.5 × 17.5 cm NaI(Tl) –well type detector with a coaxial re-entrant hole of 3 cm diameter and 10 cm height.
- The characterization of the detector in terms of the gamma detection efficiency was carried out with PENELOPE.
- The signal digitalization is performed by a time and amplitude recorder (TAR) NIM module, provided by ULS-KOREA.
- Selection of gamma gates, dead time corrections, and counting corrections are carried out offline by a code written in MATLAB.



Summary



Mostly CAEN desktop and NIM based 4-channel digitizers.

Compton Imaging is the most advanced use with solutions being commercialize with a Canadian company.

Other applications (Coincidence counting, TDCR, internal gas counting, Mn Bath) all in various levels of development and not validated.

THANK YOU, MERCI, GRACIAS & OBRIGADO

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Team Lead : Radiation, Environment and Security

