Status of the VXI electronics @ RISING

PB@gsi

RISING campaigns

- **2003 (5 weeks) fast RIB**

Aug. **Clusters + Hector**
Commissioning

Sept. **Clusters + Hector**
Commissioning +
Exp. (^{56}Cr)

Oct. **Clusters + Hector**
Exp. (^{58}Ni,^{108}Sn)

- **2004 (4 weeks) fast RIB**

May **Clusters + Hector**

Nov. – Dec. **Clusters + MINIBALL**

- **2005 fast/stopped RIB**

Spring **Clusters + MINIBALL**

Autumn **Clusters**

- **2006 stopped RIB/fast**

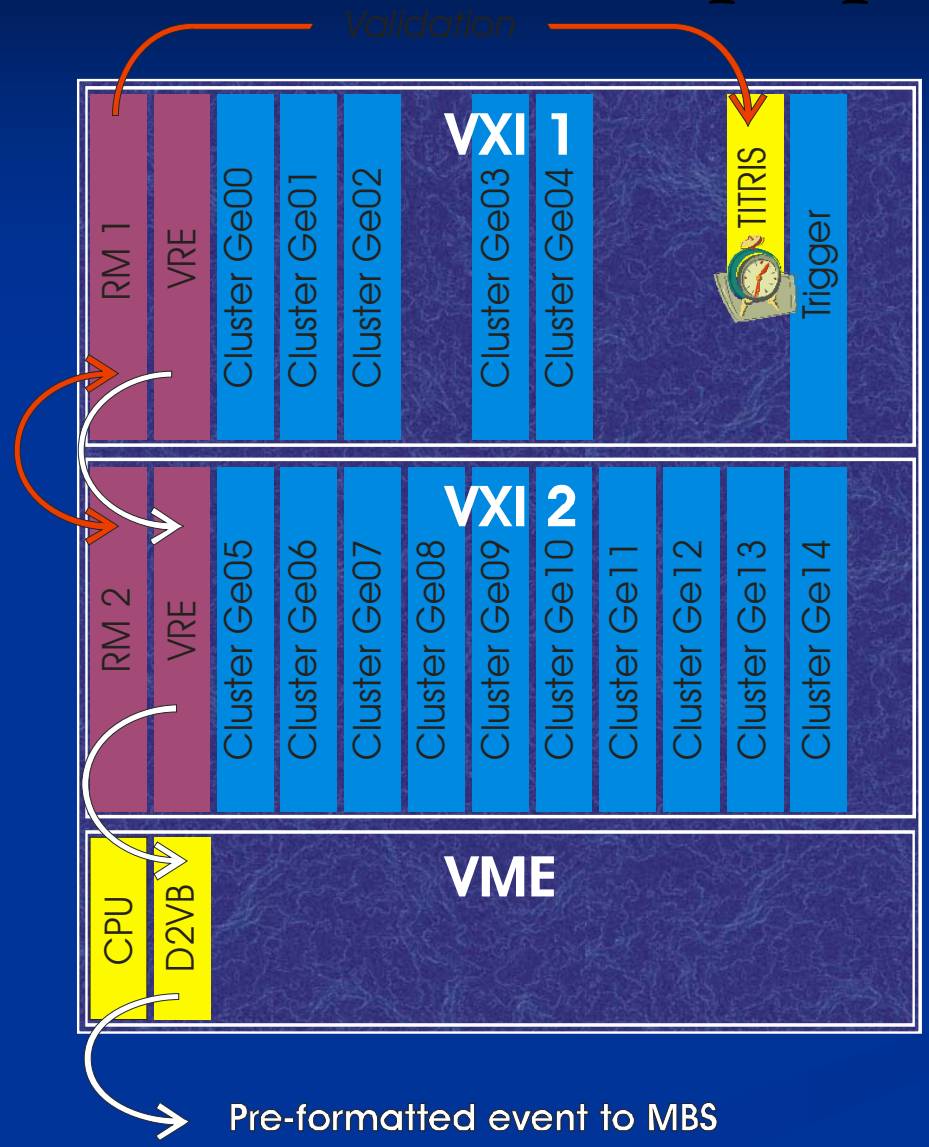
Spring **Clusters**

Autumn **Clusters + MINIBALL**
Clusters @ slow RIB

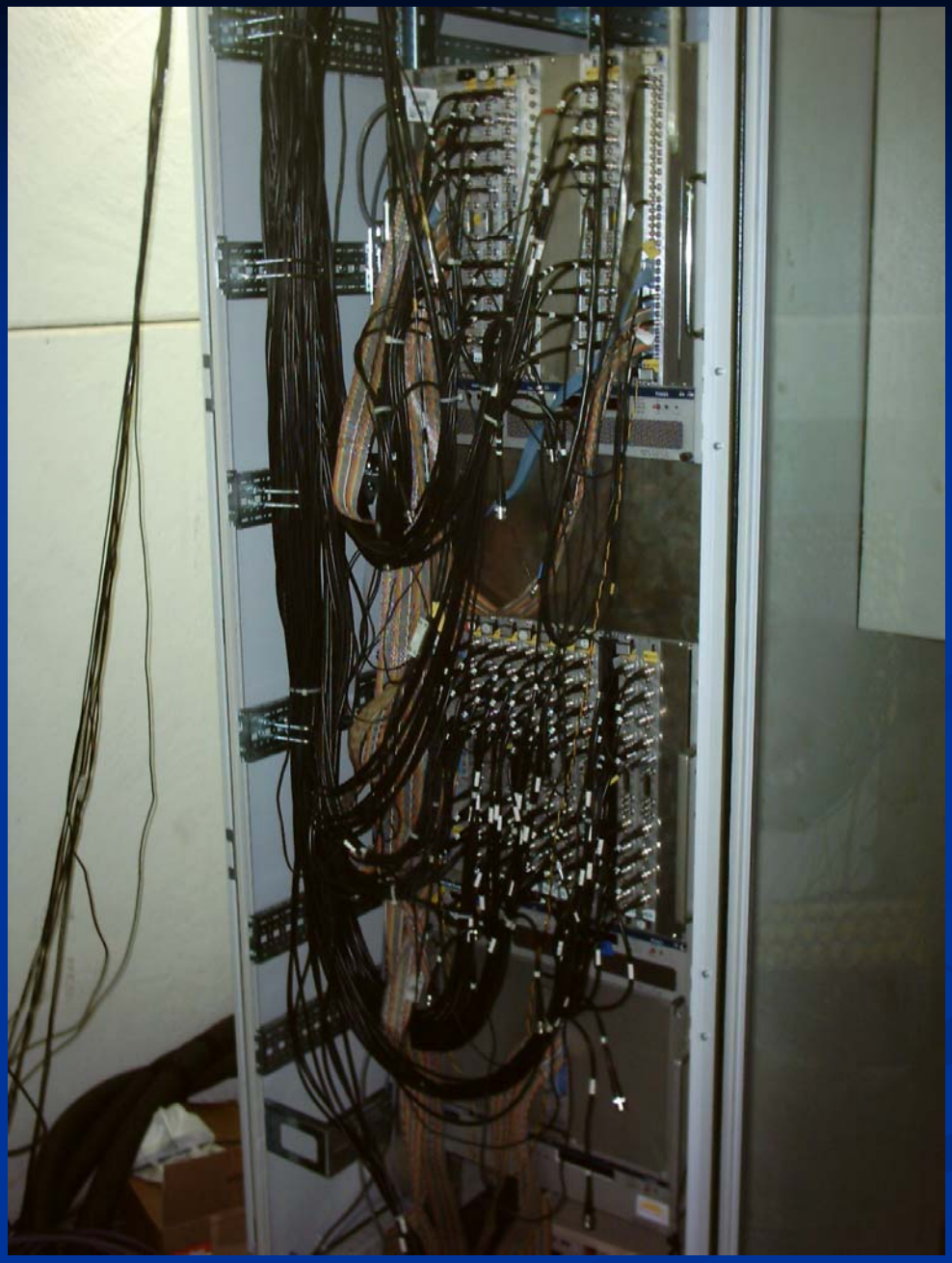
Available resources (EB heritage)

- 17 Cluster Ge cards /at present 14-15 operational/
- 2 EB Trigger Cards
- 4 RM modules /3 operational/
- 3 VRE modules
- 3 VXI crates
- 2 VME CPU
- 2 D2VB modules
- 1 dedicated Linux PC with MIDAS and fast Ethernet link to VXI
- 1 MBS event builder PC

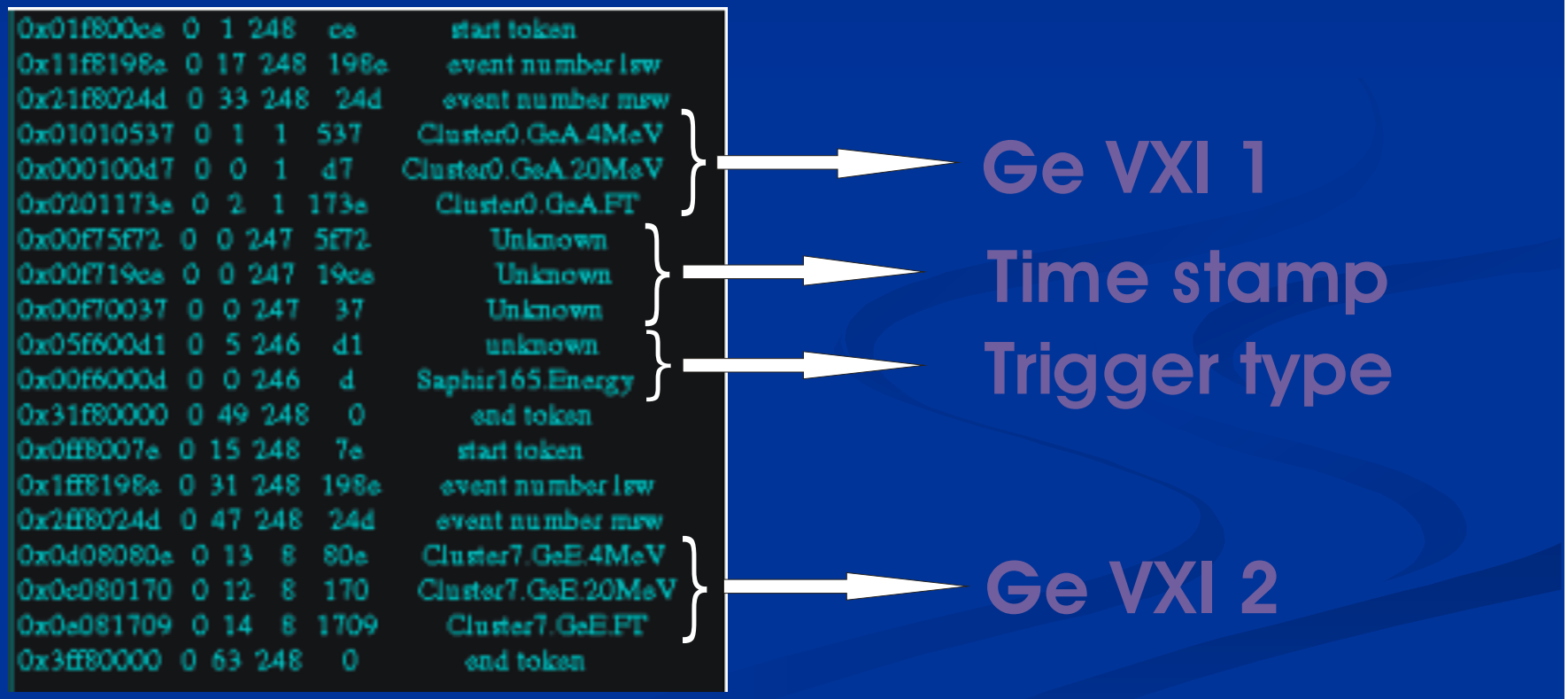
Hardware setup - present configuration



- VXI1 /RM , VRE /
  - 5 Ge cluster cards
  - TITRIS-clock module (VME standard)
  - MK2 mastertrigger
- VXI2 /RM ,VRE /
  - 10 Ge cluster cards
- VME
  - CPU (sub-event builder & histogramer)
  - D2VB (data buffer, DT32-VME interface)

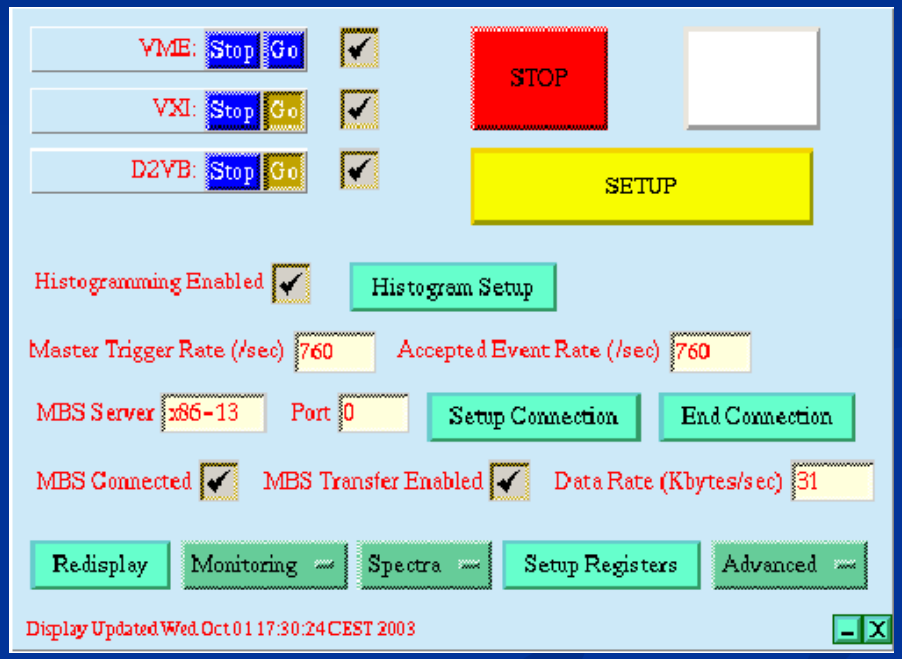


VXI event


0x01f800ce 0 1 248 ce start token
0x11f8198e 0 17 248 198e event number lsw
0x21f8024d 0 33 248 24d event number msw
0x01010537 0 1 1 537 Cluster0.GeA.4MeV
0x000100d7 0 0 1 d7 Cluster0.GeA.20MeV
0x0201173e 0 2 1 173e Cluster0.GeA.FT
0x00f75f72 0 0 247 5f72 Unknown
0x00f719ce 0 0 247 19ce Unknown
0x00f70037 0 0 247 37 Unknown
0x05f600d1 0 5 246 d1 unknown
0x00f6000d 0 0 246 d Saphir165.Energy
0x31f80000 0 49 248 0 end token
0x0ff8007e 0 15 248 7e start token
0x1ff8198e 0 31 248 198e event number lsw
0x2ff8024d 0 47 248 24d event number msw
0x0d08080e 0 13 8 80e Cluster7.GeE.4MeV
0x0c080170 0 12 8 170 Cluster7.GeE.20MeV
0x0e081709 0 14 8 1709 Cluster7.GeE.FT
0x3ff80000 0 63 248 0 end token
Ge VXI 1
Time stamp
Trigger type
Ge VXI 2

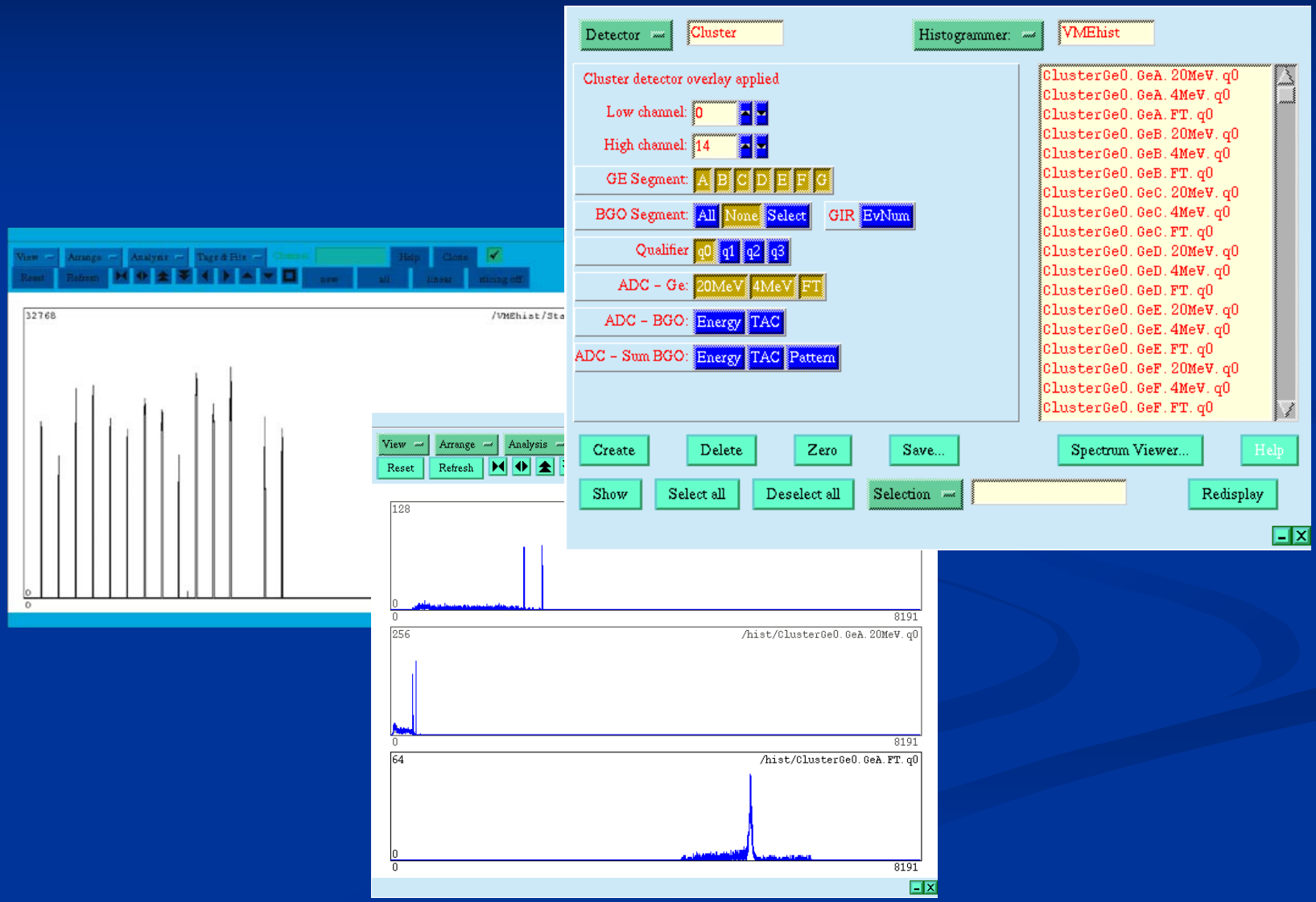
Controlling the system with MIDAS * from a dedicated Linux PC

- **Experiment control**
  - STOP & GO
  - Full automatic setup of all VXI/VME components
  - Rates and data transfer control



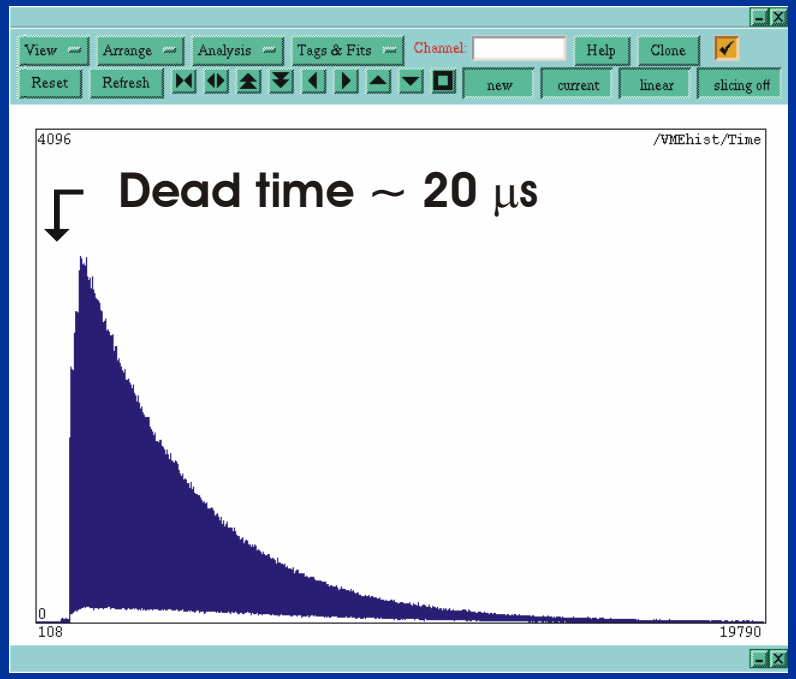
* **M**ulti **I**nstance **D**ata **A**cquisition **S**ystem

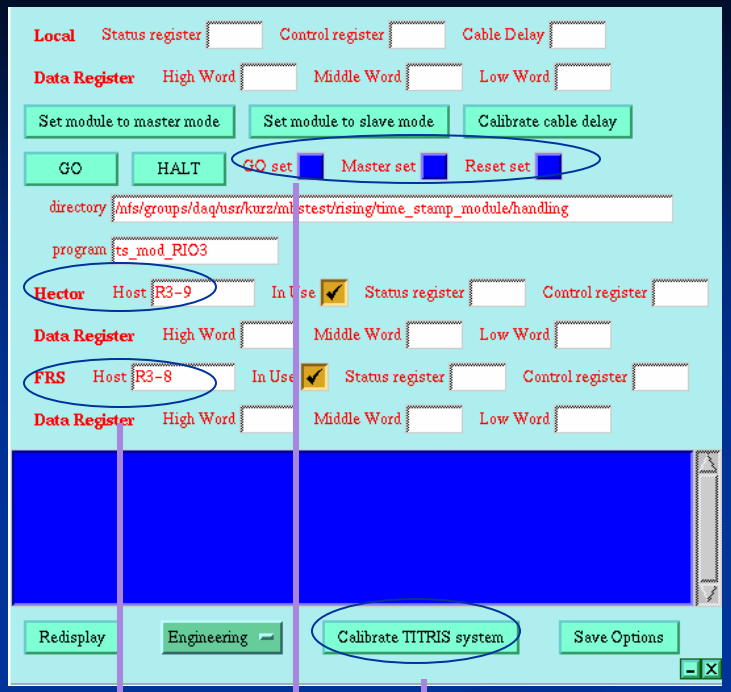
VME histogramer & spectrum viewer



Timing system- initialization and control

time difference distribution





active components status

synchronization button

Trigger types

■ single γ	SB1GD1 & SB1GD3 timing related to the 1st Ge detector in the event
■ time synchronization	FP3 low frequency pulse, only time stamp read-out
■ γ-fragment coincidence ■ correlation test-event	SB1GD1 & FP1 timing related to the external signal

Typical FT rates for RISING measurements with fast beams

background	2 kHz
source measurement	20 kHz
in beam singles	3 kHz
gamma-beam (FRS-S4) coincidences	100 Hz

Problems related to VXI encountered during last in beam measurements

- Missing bits in read-out values in some Ge cards
  (regularly distributed holes in all spectra)
- Bad interpretation of addresses

- Perturbed communication between RM and a Ge card in the 1st VXI crate
  - the problem doesn't exist at CLARA array in LNL
    (GIR – TITRIS interaction ?)
- Hanging up of the 2nd VXI branch

Further short-term improvement of the system

- Adding a 3rd VXI crate with the TITRIS-clock module and MK2 trigger card
  - Separation of the Ge VXI cards and the clock module
  - Equalization of data read out in the VXI branches

Why do we need a signal processing at RISING ?

- Observations

  with an oscilloscope:

  - huge oscillating signals correlated with a beam pulse
  - the more forward a Ge detector is placed the bigger is a contribution of such a contamination

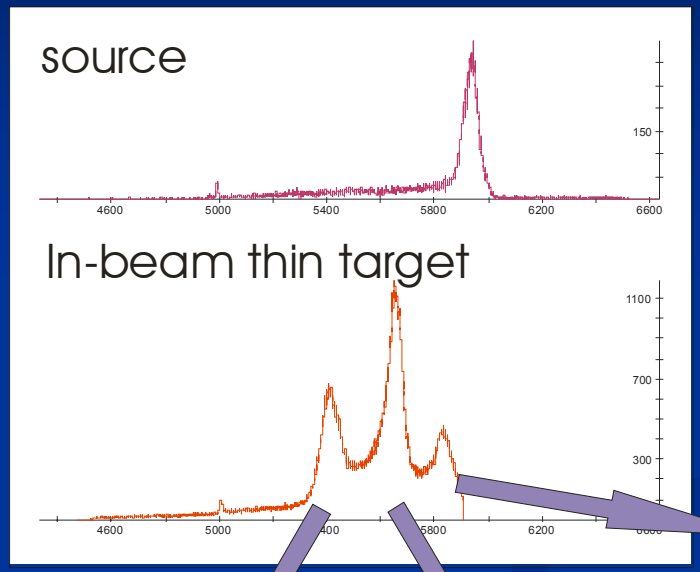
  from γ-spectra:

  - structures in a Ge time spectrum measured in-beam show clear dependence on a signal amplitude

charged particles ?

bad signal detection by a standard CFD

Structure of a Ge time spectrum



Eγ > 4 MeV