SPIRAL2 Instrumentation Coordination Committee

Meeting in GANIL
on 8-th October 2009

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ICC

- Presentation of ICC group

- Presentation and status of the different projects by each representative of detectors

- Objectives of both ICC DAQ and Electronics Working Groups

- Working Group-Organization of both ICC DAQ and Electronics Groups

SPIRAL2 ICC

Representatives of SPIRAL2 detectors projects

Detector	Hardware	DAQ
ACTAR	Frédéric DRUILLOLE	Frédéric SAILLANT
AGATA	Michel TRIPON	Eric LEGAY
DESIR		
EXOGAM2	Abderrahman BOUJRAD	Gregory LEBERTRE
FAZIA	Pierre EDELBRUCK	Pierre EDELBRUCK
GASPAR	Emmanuel POLLACO	Shebli ANVAR
NEDA		
NFS		
PARIS	Adam CZERMARK	Xavier GRAVE
S3	Nabil KARKOUR	Frédéric SAILLANT

Objectives for the EW group

Detectors coupling :

- To define what is needed: Distributed clock, time stamping, trigger
- To chose a system from exixting system: CENTRUM+ATOM (GANIL), GTS (LNL), BUTIS (GSI), TDR (Jyvaskyla), Precision Timing Protocol (IPNL)
-- Or to develop a new system

Signal processing :

- To reuse carriers and mezzanines
    - Very front end: preamps, ASICs,
    - Front end: Digitizer, processing unit, readout unit.
- To retrieve files
    - CAD design (board, component)
    - VHDL firmware: specific IP (discrimination, MWD,

Standard :

- Should we recommend an electronics standard? Which one: VME, NIM, ATCA, µTCA?
- Should we recommend communications buses? Serial (Ethernet, PCIe, ..), parallel (VME)?
- Should we recommend a remote control of the crates?
- Should we recommend specific cabinet and cooling?
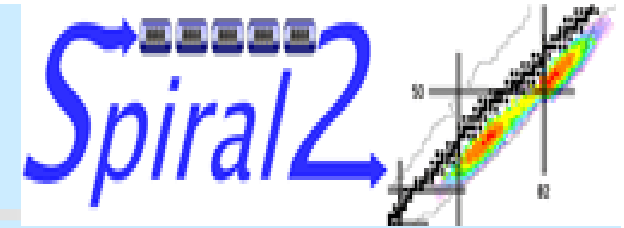
- **Make recommandations and define standards for development of the DAQ software for the different SP2 detectors**

    - ◆ **Control**
        - ☞ **Slow Control**
            - • Embedded systems
            - • System parameters setting and backup
            - • Monitoring
            - • ...
        - ☞ **Run Control**
        - ☞ **Interface between Run Control and Slow Control**
        - ☞ **Data base**
        - ☞ ...
    - ◆ **Data collection**
        - ☞ **Distributed data flow processing**
            - ➡ GANIL solution is NARVAL
        - ☞ **Interface with front ends**
        - ☞ **Interface with other DAQs**
        - ☞ **Interface with slow control systems**
        - ☞ **Interface with data analysis**
        - ☞ **Data Format**
        - ☞ .....
    - ◆ **Synergy with NUSTAR for detectors moving between DESPEC/HISPEC and SP2**

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Template of specifications for SP2 detectors (FEEDAQ SPIRAL2 meeting - Saclay, march 2008)

	Exogam	DESIR	ACTAR	PARIS	ASGS	PAZA	GASPARD
1.Number of Channels (+/-20%)	512	A few hundred	10000	1000	6840	5000-20000	15000
2.How many detector types are you considering?	HPGe (BGO, CsI)	Plastic scintillators, gas detectors, germaniums, silicons, BaF2.	Gas detector (Si, CsI, LaBr)	Scintillators: LaBr3, CsI(Na) or BaF2	AGATA (will be coupled to additional Detectors)	Si/Si/CsI(Tl)	Thin DSSD,Si,LaBrS
1. For each please reply to the following questions							
3. Geometry description							
1. Distance between pick-off signal				Depends on APD or PMT		< 10 cm	
2. Capacitance Min & Max	10 pF		~0.1 pF per pad			100-500 pF	1-100 pF
3. Radiation damage for electronics – is this a problem?	To be studied	No	No	No	No	No	No
4. Gamma absorption – is this a problem?	No	No	Possibly	Possible	Yes (add. Detectors)	No	Yes
5. In what environment for the electronics				?			
I. Vacuum	No	No			No	Yes	Yes
II. Gas (flammable?)	No	No			No	No	No
III.Where will you put the electronics?	Preamps in the detector modules. Digitizers in NIM crates at 5-10 meters.	In air	Outside the gas volume. In air (preamp in gas ???)	In air	Preamps in the detector modules. Digitizers at 5-10 meters. Preprocessing (ATCA)	FEE in Vacuum+ cooling	Preamp close to detectors, rest at the back of the last stage
4. Impedance between channels						?	No cross talk
5. Channel Polarisation							
1. +/- ve	+3500V for core electrode, 0 for	Both	Both	Both	+5000 for core elect. 0 for segments	+100-300	50-300
2. Current drawn	<< 1nA			?	<< 1nA	< 1mA	1-100nA
6. Counting Rate	For Core						
1. Mean event rate on detector	Not applicable	Not more than 1000 pps	1000 to 100000	1000 to 100000	Few Khz	< 1000 per s	Few 100 -few 10e4
2. Total data rate	3Mb/s per Crystal 30Mb/s (10 Crystals)	1000 pps	< 1000	< 1000	100 MB/s (after tracking)	< Gb/s	
3. Max counting rate/channel	100 Khz	1000 pps	100	100- 1000	10-50 Khz	<5000 per s	Few 100
4. Min counting rate/channel	0.001	0 pps	0	0		1 per s	1
5. Average counting rate/channel		10-100 pps	Few /s	Few/s	10 Khz	< 100 per s	01/10/06
6. Are you considering RDT?	Yes	No	No	Possibly	Yes	?	
7. What kind of Pre-amp Current or Charge	PAC	Mainly Charge	Charge	?	Charge	Current & charge	Both
8. Resolution needed	1.2 keV for 200 KeV 2.3 keV for 1.33 MeV	1/10000	600 e rms	?	1/1000	50 to 100 KeV	2 KeV-30 KeV(ASi) (<50KeV / 1MeV)
9. Linearities							
1. Integral non linearity	5 LSB		< 2 %	< 5 %		< 0.001	Few 10e4
2. Differential non linearity	2.5 LSB	5.00E-005			5.00E-005	? LSB	

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ICC WG meeting , GANIL 8th October 2009

ICC next steps

- **Take a decision concerning clock synchronization system for SPIRAL2 (BUTIS, GTS, other…?).**

- **Recommend electronics standard.**

- **Consider trigger or trigger-less system**

- **The next ICC meeting December this year in Orsay.**