CH/Doc/96/03

Minutes

Charissa@GANIL Meeting

Meeting held on: 1 October 1996

Meeting held at: Birmingham

Present:	W.Catford, M.Freer, N. Curtis, S. Chappell
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Minutes

1. **Items to be added to agenda/Summary of experiments:**

   NMC was unfortunately, at the last minute, unable to attend. There were no items to add to the Agenda.

   WNC summarised the recent and forthcoming experiments. These are: (a) Easter-time 1996 ^{17}B/^{19}C run on SPEG, (b) recent LISE run for gamma-rays was not part of programme but gave LISE experience, (c) study of inverse (p,d) reaction on $^{11/12}$Be in collaboration with LPC and Orsay, to use 2-D PSD's plus SPEG, rescheduled after SISSI breakdown from September hopefully to April 1997, (d) breakup of ^{12}Be to ^{6}He + ^{6}He using 2-D PSD's with CsI plus LISE, planned for June 1997, (e) hopefully neutron breakup of ^{14}Be and other haloes using DEMON, June/July/Aug 1997.

2. **British Council application for travel:**

   An application to fund a small number of visits between Birmingham/Surrey and LPC Caen had been submitted on time at Easter. Announcement was due in August. Neither UK nor Caen had heard result.

3. **Status of the mounts and preamps for running in SPEG:**

   The aim is to have these available to test during the GANIL shutdown period, in the SPEG chamber, with alphas, in Feb 97. WNC

   The preamps, mounted in 19-inch rack boxes of 40 per box, are essentially complete (say, early November). They are powered through a D-pin amphenol socket that can be connected to a Birmingham NIM unit. The back panel will shortly be modified to use lemo sockets for the inputs. The outputs are BNC's on the front panel. The bias resistors are 12 MΩ, matched to the leakage compensation circuitry of the Charissa bias supplies that are now in Birmingham. $\boxed{\text{NMC}}$

A prototype of the detector mount PCB exists. The INDRA type connectors are in Birmingham and will be incorporated in the mounting boards. $\boxed{\text{MF}}$

The cables have been ordered by J. Winfield and will be made in GANIL. $\boxed{\text{WNC}}$

It should be clarified whether the INDRA type connectors — now used also on LISE, ORION and for the SPEG beam tracking detectors — are in fact the same design as the connectors from Strasbourg, for which Steve Lawson (York) has drawings. $\boxed{\text{SPGC}}$

4. **Status of the 64 channel DA system:**

   The aim is to have amplifiers available for the tests in Feb 97 (previous item), and the entire operational system in GANIL before June 97 for the planned breakup experiment. A pre-assembly of the DA in Birmingham is planned.

   The amplifiers will result from the next batch of chip insertion and testing at Birmingham; they are presently there but without chips. This will be 2–4 weeks' work and it is planned to be completed after the new DA system is working, but before Christmas. The crates will be included. $\boxed{\text{MF}}$

   The amplifiers are presently controlled using a PC and some software development would be welcomed.

   At one stage a 64-channel system physically existed in Birmingham and at present the components are distributed between Birmingham and the ANU. A summary is given in table 1. The exabyte drive situation was uncertain. Apart from this, sufficient numbers of all items were identified between the two sites, but VME items and the workstation require clarification.

   An inventory needs to be obtained from people presently at ANU for CAMAC, VME and similar items. $\boxed{\text{MF}}$

5. **Experiments for next year with DEMON, and MF experiment:**

   It was noted that Nigel Orr presented a letter of intent to the PAC stating the intention to propose a series of experiments with the neutron array DEMON during its time at GANIL in 1997. A series of experiments to study the breakup of ^{6}He, ^{14}Be and other neutron rich nuclei was proposed, and would hopefully be performed in the second half of 1997. It was also noted that this would involve some rebuilding of the target room D6 to move the back wall further from the target, thus allowing DEMON detectors to be better stacked around zero degrees.

   It is planned that the breakup experiment proposed by MF, for a ^{12}Be beam, would be performed in the DEMON chamber previously used for the ^{19}C experiment. There will be a proton target. The breakup particles will be detected

Table 1: Items for 64-channel DA system for GANIL. The current tests of the new MEGHA data acquisition system (which works completely differently) are referred to as "new DA tests".

Item	Likely location at present
ADC's	4 in Bham, 4 in ANU
TDC's	1 in Bham and 1 spare in ANU
CAMAC crates	2 presently in Bham for new DA tests should become free
CAMAC modules	RSM, FETCH etc all in ANU as spares but can be called back
VME crate	1 in Bham for new DA tests. Need to clarify if needed for new system when goes to ANU. $\boxed{\text{MF}}$
VME modules	Full set of modules presently in Bham. Clarification needed as per previous item. $\boxed{\text{MF}}$
Workstation	One presently in Bham for new DA tests. Clarification needed as above. $\boxed{\text{MF}}$
Tape drives	To be determined. Two drives needed. $\boxed{\text{MF,WNC}}$
Trigger panels	One 64-channel panel at Bham. Need to retrieve spare from ANU if need TDC patching beyond 64 channels.
Trigger electronics	Gate and stretcher modules needed from ANU. Maybe others also. Traditional logic boxes will be used.

in 10 2-D PSD's backed by CsI detectors, giving a total of 60 channels. The expected low event rates are likely to mean that TDC's are not required. However, there are also beam tracking detectors (two x-y PPAC's near the target), a timing beam counter (possibly plastic, to be developed at Birmingham), and other possible signals from LISE (MCP and PPAC, HF timing) to be considered.

MF

There was a little discussion about the possibility of performing the breakup experiment either sandwiched between DEMON runs, or else simultaneously (e.g. a ^{12}Be beam will be needed during the ^{14}Be experiment). The rate of 10^5 pps for the ^{12}Be beam makes it difficult to operate a detector at zero degrees, but maybe not impossible.

With reference to the above, it should be established whether there are moveable arms inside the DEMON chamber. WNC

Also, with regard to combining signals from the charged particle detectors and the DEMON detectors (for either type of experiment), it should be determined whether the DEMON system uses Silena ADC's or similar with FERA readout.

WNC

6. **Extended stays at LPC and GANIL:**

   MF is planning to be at LPC for July and August, approximately, and also October (3 months in total). NMC has study leave July to December inclusive, but partly this will likely involve time in Strasbourg, FSU and ANU also.

   MF reported that he had arranged for a student of Karsten Riisager's to spend three weeks at Birmingham from 7 October.

7. **Nigel Orr's visit after 9 November:**

   It is planned to invite Nigel for seminars in Birmingham and Surrey, during which time the matters relating to the forthcoming experiments and future proposals can be discussed further. JTM,WNC

8. **Status of the new grant announcement:**

   Although no official announcement had been received, it was understood that the Charissa equipment request had been reduced by about 1/3 in the grant allocations. It was still not decided exactly how this would be applied between the different parts of the request; funds were requested for capital costs at GANIL (£264K) and ANU (£72K) and replacement/operating costs at GANIL (£128K), the ANU (£250K) and Strasbourg (£48K). The replacement and running costs were for 4 years (as was the capital) so the component for actual running costs at GANIL (£7K) was realistic.

   A summary of the request for GANIL is attached in tables 2 and 3.

   The customized design of MEGHA is not yet developed, but as a guide there was an outline associated with the grant request and a copy is attached in fig. 1.

Table 2: Summary of GANIL grant request (manpower).

NPSG effort Man years	Description
0.2/yr	design of new MEGHA module and target chamber
0.1/yr	gas detector support
0.1/yr	computing support

The idea was to allow running very close to zero degrees with a re-accelerated radioactive beam from SPIRAL.

As can be seen, the costings are realistic or even low, and the reduction in the allocation by 33% will bite hard.

9. **Proposed collaboration with Strasbourg for gamma studies:**

   WNC reported that he had sent a letter to Phillipe Dessagne and Christiane Miehé at Strasbourg, proposing a collaboration on a series of future experiments when SPIRAL comes on-line. The experiments would involve coincident charged-particle and gamma-ray detection and would require that the charged particle data were merged into the same event structure as the gamma-ray data. The gamma-ray acquisition would employ VXI, so the proposal was for Strasbourg to develop the necessary VXI electronics. This would not affect the stand-alone system based on the original Charissa DA, which will be used for charged particle experiments. A request for funds will be put forward from Strasbourg shortly.

10. **LPC budget discussions:**

    Nigel Orr had emailed WNC, MF and NMC to summarize his request for this year, and had previously consulted with regard to some of the details. Funds were requested for new beam tracking PPAC's and other items towards the DEMON experiments and our collaborative experiments. In particular, a new support structure for DEMON will allow better mounting of the neutron detectors for the breakup work in June/July 1997.

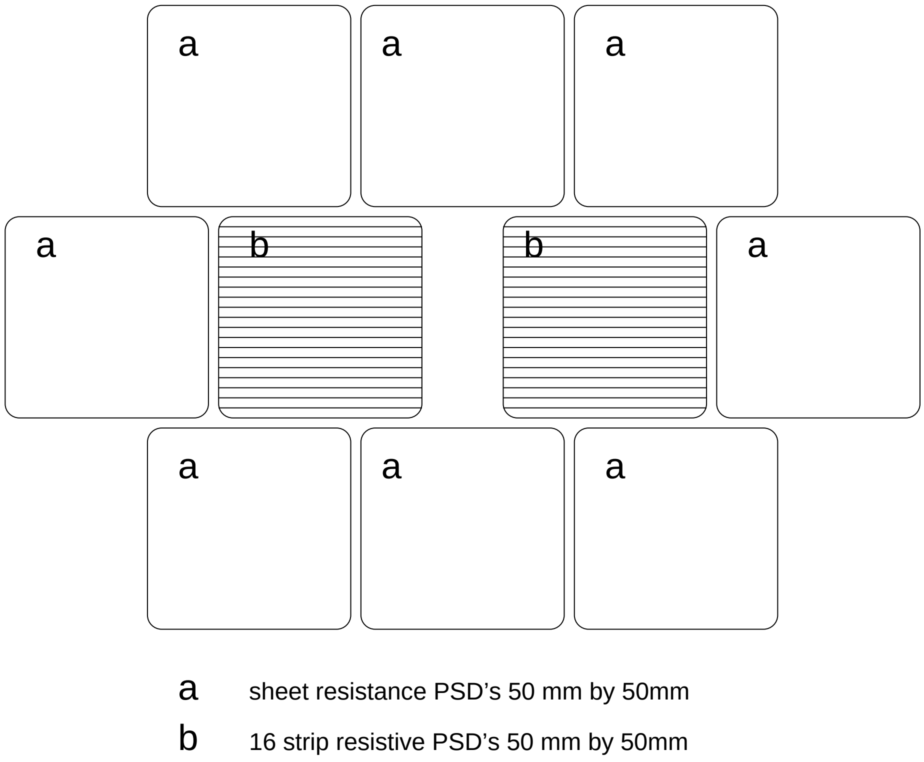
11. **Amplifiers and discriminators for new 256 channel array:**

    The question of which amplifiers should be used – the Charissa design or the CAEN units used in the recent LISE run – was briefly discussed. On an initial inspection it appeared that the Charissa amplifiers would cost £200 per channel including crates. For the CAEN system using n568 16-channel amplifers plus appropriate discriminators, the cost appeared to be closer to £300–400. Thus it

Table 3: Summary of complete GANIL grant request (cash).

Capital Costs	$\longrightarrow$	to add to existing 64-channel system
Item	£ (K)	
Preamps (144 off)	8.0	£56 per channel
Amplifiers (192)	33.6	£175 per channel
CAMAC Crates/controllers (3)	24.0	£8.0K per crate/controller
CAMAC Crates/controllers (1)	0.0	from ANU system
ADC's already owned (12)	0.0	from ANU system
Extra ADC's to buy (6)	14.0	£2.3K per item
Bias supply channels (32)	0.0	from ANU system
TDC's and CFD's (9)	16.4	£1.8K or £0.9K per item
Trigger units	15.0	
Setting up electronics	12.0	pulser etc.
VME items for DA	28.3	
Workstation/peripherals	17.4	for data acquisition control
DLT drives (2)	12.0	no exabytes costed in
Interfacing to VXI (MUST/gamma)	10.0	development at Daresbury
MEGHA module construction	5.0	2 normal + customized design for SPIRAL
Chamber construction	5.0	enough for mods and extensions
Gas handling system	5.0	small system similar to Surrey one
Detectors (4 strip detectors)	8.0	
Detectors (2 MEGHA)	50.0	main detector stock; 1 load for each module
Running costs	28.0	£7.0K per year
Replacement costs	80.0	replace damaged detectors over 4 years
Development costs	20.0	new development, Si masks, etc. over 4 years

Figure 1: Possible layout for a MEGHA-like module for radioactive beams at SPIRAL, as suggested at the time of the grant request. The orientation could feasibly be rotated.



appears that it will be difficult to find sufficient money for the amplifiers, which were costed at £175, bearing in mind the 33% cut. Certainly, the choices are likely to be limited.

The CAEN amplifiers, for example, may be required for some channels in order to allow the use of CFD's to obtain timing signals suitable for particle identification (sub-nanosecond). This will also require preamplifier modifications.

12. **Date and agenda for technical meeting:**

    It was decided that more information was needed before planning a meeting to discuss details of providing several data acquisition systems. In principle there are three DA systems and three sites at which it would be desirable to provide them. The new MEGHA system is due to take over at ANU in early 1997. The 64-channel system from Birmingham is now widely dispersed but will be reassembled before June 1997 (ideally Feb 1997) in GANIL to match our committment in the grant document. Finally, the complete original system presently at the ANU will become available. From the latter two, a 64-channel system or similar for Strasbourg could be assembled, whilst the GANIL system is expanded to 256 channels as planned.

W.N. Catford October 3, 1996