TANDEM-ALPI

NEWSLETTER

July 1992, Issue No 3

1. Overview.

The XTU Tandem runned satisfactory in the period May-July 1992, allowing the experimental program to be completed as scheduled.

The experiments completed at the XTU Tandem from January to July 1992 are listed in Table I.

The major event was the end of the commissioning phase of the GASP array with the starting of the related experiments.

The wide interest in this set-up, together with the increased beam time needed to start the commissionig phase of the ALPI Linac, caused an abnormally high ratio between requested and available time for the period September-December 1992, which was the subject of the PAC meeting in June.

We expect that in the near future the beam time will become more precious in Legnaro, requiring a strong optimization of the accelerator schedule. This means that, starting from now, it mighr be no longer possible to satisfy all user wishes about preferred dates for the experiments. Rejecting assigned dates without strong motivations will cause the loss in priority of the experiments and the need of submitting new proposals to the next PAC meeting.

The XTU Tandem schedule for the period September-December is attached.

2. Status report of the ALPI Project.

In these days the installation of the LINAC upstream the high energy leg, including the U-bend, is being completed.

The goal of the next test period (scheduled at the end of July) is to check the alignment, the whole pulsing system and the cool-down cycle of the resonators.

Vacuum control systems, resonator controllers, VME concentrators, diagnostic boxes and their dedicated acquisition system, are ready and installed in the low energy part of the LINAC.

The preliminary commissioning of the 14.4 GHz ECR source has been finished and it will be transferred to the LINAC building in the coming months.

3. Status report of the GASP Project.

The commissioning of the apparatus ended on May 14th, 1992. Some open problems remain, mostly related to the Data Acquisition System.

In the test phase 24 Ge detectors and 2/3 of the inner ball detectors were mounted in the GASP frame. The measured efficiency agrees with the expected value. For 1.33 MeV gammas the extrapolated photopeak efficiencies for the 40 detector array is 3.0 %, corresponding to 3.4% at 1 MeV.

Experiments started taking data on June 18th, 1992.

They were mainly concerned with the following PAC approved topics:

- Search of the decay out of the superdeformed bands;
- Quasi elastic proton pair transfer measurements;
- Spectroscopy in the A=133 mass region.

Since then 20 days of beam time have been used. Most of the experiments were performed using only 31 Ge detectors, due to delays in the delivery of 4 Intertechnique Ge detectors, 4 Crismatec AntiCompton shields and to repair operations on 5 ORTEC Ge detectors. The innerball of 80 BGO's is fully operational.

In the June meeting of the PAC, 32 more days of beam time have been assigned to experiments with the GASP array.

Due to the wide interest raising around this new device and to the limitations both in manpower and in beam time, the GASP group has decided to organize a one day meeting to discuss the experiments to be submitted to the next PAC. Meetings will be held every six months just before the deadline to send proposals to the PAC. Only those proposals which will be discussed and accepted in the meetings by the GASP collaboration will be submitted to the PAC as experiments supported by the GASP group. The first of these meetings is scheduled for October 1th, 1992 , at 9.30 a.m. in LNL.

Those proposals which not follow this procedure, being sent directly to the PAC, will not be supported by the GASP collaboration even if the proposal is signed by somebody who partecipates in the GASP collaboration.

For further information on this subject and on other GASP related problems, please contact Giacomo De Angelis at LNL.

4. The PAC meeting.

The Program Advisory Committee met at L.N.L on June 12, 1992, to review the proposals for the period September-December 1992.

The time to be assigned to new proposals in this period was rather scarce (only 38 days) because of carry-over from previous periods and the time devoted to the Linac ALPI tests.

New requests for Tandem beams were rather high (80% more than the available time) expecially arising for the starting of the Gasp experiments.

The experiments recommended are listed in Table II.

5. The Euroball Meeting

The Euroball Coordination Committee has decided to held at the Laboratori Nazionali di Legnaro from 28th to 30th September 1992 the first "Euroball User Meeting".

During the three days the following topics will be discussed:

- detector developments,
- Eurogam I and Gasp performances and results,
- ancillary detectors,
- electronics and data acquisition systems,
- data analysis,
- inspiration on new experiments and physics.

For information about the meeting please contact S. Lunardi, Dipartimento di Fisica, Via Marzolo 8, I-35131 PADOVA; e-mail: LUNARDI@PADOVA.INFN.IT; FAX: 39-49-844245.

6. The Next User Meeting

The next meeting of the Tandem-ALPI users will take place on November 5th, starting at 9.30 at LNL.

The goal of the meeting is to provide the users with complete information on the possibility of using Tandem and Linac beams during the first half of the 1993 (period to be allocated by the next PAC meeting).

Detailed information will be sent by e-mail in September.

7. Progress in the XTU Tandem beams

Cr beams production from the sputtering source has been recently improved at the XTU Tandem Facility. CrH^- beam intensity of 100 nA have been obtained and used for the experiment 92.17. The beam intensity was constant over a 3 days run.

^{11}B beams have been obtained by molecular BN^-. Beam currents from the sputtering source are in the range 700-1000 nA. BN^- should provide intense ^{14}N beams as well.

More details on beams developments can be obtained from F. Scarpa.

TABLE I

EXPERIMENTS COMPLETED AT XTU TANDEM

IN THE PERIOD JANUARY-JULY 1992

92.1 Measurement of static electromagnetic moments
(A. Iordachescu (Bucarest) - F. Brandolini (Padova)).

92.3 Study of statistical fluctuations of cross-section to determine the interaction times in heavy-ion dissipative reactions
(M. Sandoli (Napoli)).

92.4 g-factor measurement with transient field technique.
(F. Brandolini (Padova)).

92.5 In beam test of the gamma ray spectrometer GaSp
(C. Rossi-Alvarez (Padova)).

92.7 The multifold of linking transitions from superdeformed to normally deformed states in ^{143}Eu
(A. Atac (N.B.I.)).

92.9 Entrance channel effects in the decay of ^{160}Yb compound nucleus
(F. Gramegna (LNL)).

92.10 The GDR in hot ^{40}Ca nuclei-New detector developments.
(D. Fabris (Padova)).

92.11 Study of the band structure built on the πh11/2$\times\nu$h11/2 configuration in the doubly odd nucleus ^{134}Pr.
(C.M. Petrache (Bucharest and LNL)

92.12 Study of the excitation energy equilibration in dumped heavy ion reactions at 10 MeV/amu, detector developments.
(L. Fiore (Bari))

92.13 Resonances in medium and heavy composite systems
(U. Abbondanno (Trieste)).

92.14 Fusion cross-section and average angular momenta around the Coulomb barrier for ^{58,64}Ni+^{64}Ni and other systems leading to the same compound nucleus with increasing mass asymmetry
(P. Spolaore (LNL)).

92.15 Elastic and quasi-elastic scattering of ^{32}S+^{208}Pb at energies close to the Coulomb barrier
(L. Corradi (LNL)).

92.16 Crystal blocking lifetime measurement in heavy-ion induced reactions
(F. Malaguti (Bologna)).

92.17 Quasi-elastic proton pair transfer, detector test
(J. Gerl (GSI)).

92.18 Search for possible octupole correlation effects in ^{147,149}Pm
(A.M. Bizzeti-Sona (Firenze)).

92.19 A search for the linking transitions between superdeformed and normal states
(G. Lo Bianco (Milano)).

TABLE II

PAC APPROVED EXPERIMENTS

FOR THE CYCLE SEPTEMBER-DECEMBER 1992

92.17B Quasi-elastic proton pair transfer
(J. Gerl (GSI)).

92.20 Near yrast nuclear structure investigation of doubly odd Lu isotopes
(D.R. Napoli (LNL) and M. Debray (Tandar))

92.21 GDR broadening and disappareance in hot nuclei
(D. Fabris (Padova)).

92.22 Development and test of detectors for charged particles
(G. Prete (LNL)).

92.23 Liquid scintillator detector response function to neutrons
(A. Pantaleo (Bari)).

92.25 Detailed measurements of fusion cross-section of ^{58}Ni+^{60}Ni around the Coulomb barrier
(D.R. Napoli (LNL)).

92.26 Search for resonances in heavy ion reactions
(U. Abbondanno (Trieste)).

92.27 A search for hyperdeformed bands: fluctuation analysis, rotational mapping and studies of discrete structures in ^{184}Pt
(R. Bark (N.B.I.)).

92.28 High spin states in ^{45}Sc via fusion-evaporation reactions
(W. Meczynski (Krakov)).

92.29 Measurement of gyromagnetic ratios and half-lives in fusion reactions
(F. Brandolini (Padova)).

92.31 Search for extremely deformed shapes in light Pb isotopes
(W. Korten (N.B.I. and Bonn))

TANDEM XTU SCHEDULE FOR SEPTEMBER-DECEMBER 1992

CALENDARIO TANDEM XTU PER SETTEMBRE-DICEMBRE 1992

Sep. 21-26	92.06	P. von Brentano	-10 (GASP)	^{29}Si,^{34}S 14.5 MV
Sep. 27-Oct. 2	92.08	G. De Angelis	-10 (GASP)	^{30}Si,^{32}S 13-14 MV
Oct. 3-5	92.20	Napoli- Debray	-10 (GASP)	^{28}Si,^{19}F 14.5 MV
Oct. 6	92.25	D.R. Napoli	-20 II	^{58}Ni puls. 14.-15.5 MV
Oct. 7-9[1]	TEST OF GASP + RMS COUPLED OPERATIONS Dir	C. Rossi-Alvarez	-10 (GASP)	14.5 MV
Oct. 10-11[2]	92.28	W. Meczynski	-10 (GASP)	^{18}O 9. MV
Oct. 12[3]	TANDEM CONDITIONING			
Oct. 12-13[4]	BEAM TEST FOR THE SLIDING SEAL Dir	F. Malaguti	+50 (SS)	14.5 MV
Oct. 14[5]	TANDEM CONDITIONING			
Oct. 14-18	92.17b	J. Gerl	-10 (GASP)	^{52}Cr 15.5 MV
Oct. 19-21	92.31	W. Korten	-10 (GASP)	^{30}Si,^{34}S 14.3-15.5 MV
Oct. 22-31	LINAC			
Nov. 1-8	TANDEM	MAINTENANCE& CONDITIONING		
Nov. 9-13	92.25	D.R. Napoli	-20 II	^{58}Ni puls. 14.-15.5 MV
Nov. 14-16	92.29	F. Brandolini	+10^o (MIPAD)	^{28}Si 12-13 MV
Nov. 17-30	LINAC			
Dec. 1	92.23	A. Pantaleo	+30II	^{32}S 15.5 MV
Dec. 2-6	92.21	D. Fabris	-40^{o}II	^{12}C pulsed 15.5 MV

Dec. 7-8	92.26	U. Abbondanno	+50 (SS)	^{58}Ni 13-14 MV
Dec. 9-14	LINAC			
Dec. 15-21	92.27	R. Bark	-10 (GASP)	^{34}S 14.-15.5 MV
Dec. 22	92.22	G. Prete	+50 (SS)	^{16}O,p 14. MV

[1] this test will end at 12 p.m., Oct 9.
[2] from 0 a.m., Oct. 10, to 12 p.m. Oct. 11.
[3] from 0 to 8 a.m., Oct. 12.
[4] this test will end at midnight, Oct. 13.
[5] from 0 to 8 a.m., Oct. 14.
Dir = Director's Time
CS1m = 1 m diameter scattering chamber (+20 II beam line)
GASP = Gamma-ray Spectrometer
SS = Sliding Seal scattering chamber
RMS = Recoil Mass Spectrometer
MIPAD = 6 Ge gamma array