

Olsen

- Agenda:
- 1) Current Run
 - 2) Results on R
 - 3) New dE/dx Calibration

1) Current Run

The biggest problem JADE was suffering from was the frequent 'time outs' from the muon CAMAC crate so Rolf Felst asked someone from the Manchester group to give the latest news. Tim Greenshaw replied that the cause was still unknown. (Since the meeting, the fault has been traced to an occasionally late reset signal to the muon crates after a T2 reject. This has been cured by advancing the reset signal by 60 ns.) E. Pietarinen announced that a hardware problem with the FAMP has been fixed.

2) Reset on R

Makoto Minowa then presented the latest results on multi-hadronic event production. First he explained the luminosity measurement which is derived from the end cap Lead glass Bhabhas because of the higher statistics compared with the barrel Bhabhas. Then he showed the R plot which exhibited 3 small peaks. Unfortunately none of them was big enough to be toponium - the largest had a $\Gamma_{ee} \cdot B_{had} < 1.93$ keV at 44.38 GeV. The average R value was 4.60 ± 0.24 .

3) New dE/dx Calibration

Götz Heinzelmann gave a status report on work he and Lutz Becker have been doing on dE/dx calibration following on where Ralph Eichler and Peter Dittmann left off. He explained that the old resolution for electrons in Bhabha events was 9% but is now 7% and will soon be 6.5%. He showed a transparency listing 10 corrections that were needed to get this resolution and everyone present was suitably impressed. The resolution for tracks in multi-hadronic events is now 8% and will soon be 7.5%. This is lower than for Bhabha events because of the lower statistics and the confusion that occurs with close tracks. To make the most of this new calibration a new routine has been written by John Arthur Skard to calculate the probability of a track being e/ π /K/p using both momentum and dE/dx errors. Also the theoretical expectation for each particle type has been improved by Karl Ambrus. Finally a new version of DEDXBN (the dE/dx analysis routine) will be released soon which performs its own z-recalibration and hit cleaning of the JETC bank.

Next JADE Meeting 1/12/83

Chris Bowdery 30/11/83

Olson

Minutes of the JADE Meeting held on 17/11/83

- Agenda: 1) Current Run
- 2) Results

1) Current Run

Rolf Felst gave a brief report on the magnet water leak that occurred last Thursday evening (10/11/83). This was due to a problem in the cooling water hoses some of which were replaced the next day. The rest will be replaced during the break over Christmas and the New Year. Beate Naroska reported that if the scan finishes early, as seems likely, there will be some machine studies or maintenance before Christmas. The PETRA restart will be early in January 1984 (if Big Brother allows it!) and after 1 or 2 weeks of machine studies there will be luminosity runs until the 9th April. Then there will be a 6 weeks shutdown during which JADE will install the new z and beam pipe chambers.

Rolf Felst finished the meeting by explaining that the injection problems experienced in the previous weeks were traced to some faulty electronics in the RF power supplies.

2) Results

These minutes would not be complete without mentioning 2 recent results which vividly demonstrate the great improvements made by JADE's football team. On the 14th November, the Return-of-the-JADITES were pitted against TASSO. Our heroic players succeeded in putting the ball past the (hadron) arms of the TASSO goalkeeper, 8 times! This has put to rest any doubts about our angular resolution even under varying field conditions. Two days later it was the turn of the MARK J Dragons to be annihilated. Six times high energy projectiles penetrated their BGO* and landed in the back of their calorimeter, er... sorry, net!

Return-of-the-JADITES	8	TASSO	0
Return-of-the-JADITES	6	MARK J DRAGONS	1

Next JADE Meeting 24/11/83

Chris Bowdery 24/11/83

*BGO - Backs, Goalkeeper and Others

Minutes of the JADE meeting held on 27.10.1983

- Agenda: 1) Present Run
 2) Results

1) Present Run:

Until today, PETRA has been running well; over the last two weeks we have had average luminosity $\sim 100 \text{ nb}^{-1}/\text{day}$. Right now, there are problems in maintaining the fine-tuning of the beams.

2) Results:

a) Dieter Haidt presented his latest ideas on flavour separation, which threatened to separate the men from the boys in a mathematical sense. However, Dieter endeavoured to make it all self-evident to us. This analysis is still under development.

b) Return of the Jadites 0 Pluto Failures 3 (26.10.83).
The Jadites played brilliantly throughout, but drastic recalibration in shooting for goal is obviously required - angular resolution was typically 1000 milliradians! As you can see from the scoreline, the Failures entered our half of the pitch three times and scored three diabolically lucky goals. There's always the next time.

Next JADE meeting: 3.11.83

Hugh McCann, 1.11.83

Minutes of the JADE meeting held on 20.10.1983

- Agenda: 1) Present run
2) Results
3) Online system

1) Present run

PETRA has been performing well in the last week or so, giving us an average of $\sim 60 - 80 \text{ nb}^{-1}$ per day and increasing. Further discussions have taken place with the other experiments on the question of how much data we require at each scan point; we will continue with $60 \text{ nb}^{-1}/\text{point}$, which would rule out the $1S$ toponium with 5 standard deviation confidence in the event that we don't see it.

2) Results

T. Nozaki presented detailed results on the photon structure function. Complicated statistical techniques have to be employed due to the severe systematic effects which result from the detector shape etc. Furthermore, assumptions about the basic mechanisms involved have very large systematic effects on the results. This analysis is now finished and detailed results will be circulated soon.

3) Online system

Howard Mills described two new online rejection techniques, one for cosmic rays and the other for beam gas events. It was decided to implement the former cut, but it was thought that more consideration should be given to the latter. How long do you think it will be before the NORD stops writing events to the IBM and just posts finished papers to Physics Letters instead?

Next meeting: 27.10.1983

H. McCann, 24.10. 1983

V. Lorenz

Minutes of the JADE meeting held on 13.10.1983

- Agenda:
- 1) Present run
 - 2) Future schedule
 - 3) Miscellaneous

Before commencing the meeting, Mr. Mashimo from Japan was welcomed to the JADE collaboration. He is presently working for the University of Hamburg.

1) Present run

Wulfrin Bartel reported on the present run. More lead shielding was installed in the JADE hall today during access. This was done after studies of the radiation levels in the hall using the safety group's new instrument, which apparently has a very long cable! They're not daft, these safety people.

The new collimators near our interaction region have the effect of reducing the "wings" on the Z-vertex distribution. After each injection, the JADE shift crew MUST request the PKR crew to close the new collimators, which are known as "NW left and right".

The jet chamber averages about 300 random hits per event at present, but the radial distribution increases with radius, which is the opposite of what can be expected from synchrotron radiation. This effect is not understood.

Beate Naroska pointed out that, after power failures, the Lead Glass and Beam Pipe high voltage systems have to be reset.

2) Future Schedule

Wulfrin Bartel reported on this week's meeting of the PRC, which recommended that, after the present scan, PETRA should run at the highest possible energy where reasonable luminosity can be achieved and should collect around 10 Pb^{-1} at that energy.

As far as the present scan is concerned, all experiments except TASSO want to collect 60 nb^{-1} per scan point so that they can each individually search for new phenomena. Apparently the Directorate have sympathy with the TASSO view, which is to finish the scan as soon as possible by taking only 30 nb^{-1} per point and pooling all the data of the four experiments with the specific aim of looking for a $(t\bar{t})$ resonance in the hadronic cross-section. It seems likely that the Directorate will wish to discuss this matter further with the experiments, but we decided that we should stick to our previous policy and make it clear that we don't mind at all if TASSO switch off after 30 nb^{-1} at each scan point.

3) Miscellaneous

Wulfrin reported on yesterday's meeting of the experiment spokesmen with Dr. Söding where the experiments pooled the data on the hadronic cross-section in the present run. No significant bumps were seen.

Next Meeting: 20.10.1983

Hugh McCann, 14.10.1983

Minutes of the JADE Meeting Held on 6.10.1983

- Agenda:
- 1) Present run
 - 2) Rehearsal of PRC talk
 - 3) Miscellaneous

1. Present Run:

There was no discussion of the present run, since everyone is depressed with the current status of PETRA.

2) Rehearsal of PRC talk:

Austin Ball presented his PRC talk for our approval. Several constructive criticisms were put forward, although, generally speaking, most of us found his presentation to be very good. As his business manager, I have great confidence in "plugging" his next performance at the DESY Hörsaal on Monday 10th October. Supporting cast will be provided by the other PETRA experiments.

3) Miscellaneous

Peter Steffen told the meeting that the Jet chamber recalibration of 1982 multihadron data is now complete; a note will be circulated.

Next JADE Meeting: 13.10.1983

Hugh McCann, 7.10.1983

Minutes of the JADE meeting held on 29.9.1983

- Topics:
- 1) Present run
 - 2) The b lifetime
 - 3) Miscellaneous

1) Present run

Rolf Felst reported that PETRA now has 56 installed 5-cell and 56 7-cell cavities. With the additional power of the 1 GHz cavities, a maximum beam energy of between 22.5 and 23 GeV should be attainable.

2) The b lifetime

Roger Barlow gave a status report of his work on determining the lifetime of the b quark. Because of problems due to the dependence of the extracted lifetime on the cuts applied to the muon data, he would not commit himself to a number yet. Peter Steffen also reported on his work on this topic. He has used the new jet chamber calibration for 1982 and obtained a preliminary value of 1.8 ps but with 'large' errors. After some discussion, it was agreed by the experts that the MAC result of $1.8 \pm 0.6 \pm 0.4$ ps may not be too reliable.

3) Miscellaneous

Hugh McCann reported that JADE's value for the branching ratio $b \rightarrow \mu X$ is now $(10.6 \pm 2.9 \pm 2.5)\%$ in good agreement with the world average.

C. Bowdery, 20.10.1983

The Future

Rolf Felst started the meeting with the good news that there has been no price increase this year for electricity so PETRA will be operated into December. This should give us enough time to continue the high - energy scan to 45 GeV. It was decided that JADE would discuss plans for further running this year and next at the meeting on the 8th of September.

The Present State of the Past

Peter Steffen gave an account of his continuing work on the $r\phi$ calibration of the jet chamber. His new scheme involves 2137 constants which need to be determined. At present he has improved calibration files for Spring 1982 and 1983. There has been a 2% change in the determined drift velocity and very small changes in the wire positions. This gives us now a momentum resolution, $\frac{\Delta p}{p^2}$, of 1 to 1.5% with a vertex constraint and 1.5 to 2% without. There are still some problems with ring 3. It is hoped to extend this work to cover other run periods and make it available soon as standard calibration.

Chris Bowdery 5/9/83

Minutes of the JADE Meeting held on 28th July, 1983

- Agenda :
- 1) Present Run
 - 2) Physics Results
 - 3) Tracking Program Improvements

1) Present Run

Beate Naroska reported that the TOF counter thresholds had been raised by a factor of 2 thus reducing the veto rate in the T1 trigger stage. Although this has improved the trigger efficiency, we no longer have the capability to trigger on 1/3 charged particles. In addition the lead glass endcap trigger threshold was raised and 2 triggers were removed in order to reduce dead time (2 TBG with neighbour suppression and 2 TBG collinear).

It was decided that for the final days of the run period, PETRA would operate from 21.515 GeV and upwards to repeat the measurements at these energies. This was because these points in the energy scan were somewhat high for all experiments. We expected no problems with our detector at these energies but CELLO and TASSO were known to be having bad backgrounds. Beate finished by reporting that luminosity runs would cease on Sunday morning (31/7/83), leaving the last 24 hours for machine studies.

2) Physics Results

a) Makoto Minowa presented the latest value of R for the energy scan (4.01 ± 0.13) and showed that the data rule out toponium production up to 43.18 GeV. He then launched into a report about multi-gamma final states as a signature for magnetic monopole pair production. The object was to search for events with no missing energy, at least 10 photons and very few charged tracks. After scanning all possible candidates, removing those recorded during beam losses and I.D. 'trips', no events were left. This translated into a cross section for multi-gamma production of less than $1.2 \times 10^{-37} \text{ cm}^{-2}$ (95% C.L.). It was agreed by all that this was a worthwhile result regardless of the possible connections with magnetic monopoles.

b) Karl-Heinz Hellenbrand then took the floor to present his work on inclusive electrons in multi-hadronic events. Starting from the TP events on MSS, he had recalibrated the dE/dx to select electrons and then refined the selection

using the lead glass barrel counters analysed by the Karlheinz Meier method. Finally the electron candidate events were visually scanned. By applying a p_T and Q_1 cut, he extracted a preliminary value for the b asymmetry in conjunction with the Lund Monte Carlo predictions.

Karl-Heinz then returned to his seat; his 1 hour-plus talk having broken new philosophical (as well as physics) ground. At one point he was heard to exclaim that the predictions from the untracked M.C. were "only numbers"!

c) Beate Naroska gave the final physics talk about her work on extracting the muon pair asymmetry from the 1983 data. The result, $-13.3 \pm 6.0\%$ is in perfect agreement with GWS theory and Naroska's Law ("All asymmetries should be no better nor worse than 2σ "). Incidentally Paul Murphy claimed to be able to derive this law from first principles !

3) Tracking Program Improvements

The long-suffering JADE members heard a proposal by Karl-Heinz Hellenbrand and Chris Bowdery to improve the JADE Tracking Program. The present version does not store the association of simulated jet chamber hits with the 4 vector input particles nor does it record the history of each particle prior to tracking. The former problem will be solved by a new tracking routine while the latter has already been fixed up with a new BOS bank. The details will be discussed in the next Software Meeting.

NEXT JADE MEETING : 11/8/83

C. Bowdery

J. Olsson

Minutes of the JADE Meeting held on 21st July, 1983

- Agenda : 1) Trigger
2) Computer Help
3) Present Run

1) TRIGGERS

1. Bob Glasser proposed including on-line muon rejection with the "Zorn" trigger (trigger bit 15), as was done with the Olsson trigger last month. It was decided to put this into the trigger this weekend, so that its effect can be gauged with data from the present run.

2. Hanns Krehbiel gave a report on the triggers with respect to the high dead-time. He showed pictures of random trigger events to illustrate the problems, and several courses of action were proposed. After much discussion, it was decided to raise both the TOF counter thresholds and the lead glass E₄ level.

Beate Naroska pointed out that raising the TOF thresholds will lower our efficiency to trigger on charge one-third quarks.

The 2TOF.E₂ colinear track trigger (bit 17), which has been dominating the other triggers during this period of high dead-time (since the bit 31 trigger was removed altogether), should be investigated to see if it contributes events which don't have any other trigger bits on to any of the physics data samples. If not, this trigger should be removed before the next run period. Beate also added that some effort should be given during the coming shutdown to providing PKR with a better background monitor. The present beam-pipe counter current monitor seems to have a weak correlation with the high dead-time problem, and one based on the amount of dead-time would also monitor problems with the IBM link.

2) COMPUTER HELP

Bob Glasser described a new HELP facility which he has installed on the IBM. This is modeled after the PLUTO HELP facility, and should be of great use to new members of JADE and those of us with weak memories. All are encouraged to try it out, and experts are particularly encouraged to add information to the present selection. The HELP system was described in a preliminary version of a JADE computer note handed out at the meeting; a final version of the note will be distributed soon.

3) PRESENT RUN

1. Tatsuo Kawamoto talked about the status of the REDUC1 analysis. Runs 13088-13522 from this run period have been completed and are ready for use here. The barrel and end-cap luminosities from these runs were presented, and are available in the following files :

F22TAK.DISK.BRLLUMI.G532551

F22TAK.DISK.ENDLUMI.G532551

A systematic difference between barrel and endcap luminosity (dependent on the beam energy) was discussed, and it was stated that the barrel luminosity is the best value to use. There is good agreement between the on-line, fastsel, and reducone calculations of luminosity. Tatsuo also said that problems with an AC power line for the lead glass high voltage system on Saturday July 17 lead to 126 barrel LG counters having random voltages for runs 14324 and 14325. It has not yet been determined how badly this affects the data taken in these two runs.

2. Peter Steffen said that the problem with the wrong lead glass calibration on the REDUC1 tapes from Rutherford Lab is limited to the first three tapes from this run period. This calibration problem will be corrected at DESY for those tapes, and data analysis at Rutherford, which was halted for awhile due to this problem, has now been resumed.

Next JADE Meeting : 28/7/83

S. Wagner
25/7/83

MINUTES OF THE JADE-MEETING

held on 14th July, 1983

- Agenda :
- 1) Present Run
 - 2) Miscellaneous
 - 3) Physics Results

1) Present Run :

There was a general discussion of the high dead-time problem. Wulf Bartel noted that the problem seems to be sensitive to the position of the beam in the Nord Hall cavity region.

2) Miscellaneous :

Rolf Felst reported the values for the B lifetime currently being released by MAC and MARK II. These numbers are consistent with the upper limit previously published by JADE.

3) Physics Results :

- I. Sachio Komamiya presented more results from the search for stable scalar quarks. This talk concerned the case where both squarks fragment into neutral smesons.
- II. Hiroshi Takeda presented results from a search for massive photinos.
- III. Jan Olsson gave the results from his search for the $\rho^0\omega^0$ exclusive final state in $\gamma\gamma$ interactions.
- IV. Siegfried Bethke gave an update on the 4-jet analysis of the multi-hadron data.
- V. Hiroshi Takeda gave the final pretalk for his DESY preview of the JADE results which will be presented at the Brighton Conference.

NEXT JADE MEETING : 21/7/83

S. Wagner 18/7/83

Oleson

Minutes of the JADE meeting held on 7/7/1983

- Agenda:
- 1) Present run
 - 2) Results
 - 3) Brighton Conference
 - 4) Miscellaneous

1) Present run:

Hiroshi Takeda pointed out that the REDUC1 output tapes coming back from the Rutherford Laboratory have a severe problem regarding lead glass calibration.

2) Results:

- a) Jan Chrin reported on the search for muons (and top) in the latest data, $\sqrt{s} = 40 \cdot 80 - 42 \cdot 34$ GeV.
- b) Sachio Komamiya presented the results of a search for supersymmetric quarks, carried out with Karl Ambrus. There was an interesting discussion on several aspects of this work. From now on, we should change Sachio's name to "Sachino".

3) Brighton Conference

The status of current analyses was considered with regard to the Brighton Conference. The usual presentation of results by all DESY experiments will take place in the main auditorium on Friday 15/7/83. Hiroshi Takeda will present the JADE results. He almost had to be helped up from the floor when asked to give the talk to JADE on Monday 11/7/83. There is no truth in the rumour that he was heard to swear in Japanese.

4) Miscellaneous

There was some discussion regarding the TASSO presentation of 5/7/83 on the subject of QCD. Rolf Felst emphasized that the JADE publication on the determination of α_s still represents our latest knowledge and, in any case, it is consistent with the TASSO results (did they have any conclusions?) despite the obvious prejudice of their presentation.

Next JADE meeting: 14/7/83

H. McCann 11/7/83

Olson

Minutes of the JADE meeting held on 30/6/83

- Agenda:
- 1) Present Run and Schedule
 - 2) Results
 - 3) Miscellaneous - Computer Time
- Safety

1) Present Run and Schedule

Wulf Bartel reported the outcome of the earlier scheduling meeting. The scan will be continued up to the highest energy attainable (between 21.5 and 21.6 GeV). A 6 week shutdown will commence on August, 1st, during which 20 more cavities will be installed in PETRA. Running will recommence in September following about 2 weeks machine physics.

Major JADE activities planned for this shutdown are:

- i) installation of synchrotron radiation masks in the beam-line, necessitating removal of the mini- β quadrupoles.
- ii) repair of a frame of muon chambers inside the magnet yoke, which requires the yoke side-plate to be removed.

2) Results

- i) Sakue Yamada and Tomio Kobayashi reported limits on the masses of possible scalar leptons. For this very general, systematic search, assumptions about the processes and particles involved were minimised.
- ii) Karlheinz Meier presented further improvements of the analysis of inclusive n 's, emphasising indications that the η^0/π^0 fraction rises as a function of sphericity. As a by-product of the work on π^0 's, a preliminary D^{0*} signal has been isolated.
- iii) Makoto Minowa discussed the online cross-section from the most recent section of the energy scan.
- iv) Tadao Nozaki talked about his work in extracting the photon structure function using single tagged two photon events.

3) Miscellaneous

- i) Computer time

Production analysis of scan data now requires 100 mins priority time per day. The remaining priority time is to be preferentially used by those preparing material for the Brighton and Cornell conferences.

Anyone requiring > 20mins in one day should contact Wulf Bartel.

ii) Safety

Wulf Bartel exhorted JADE members to be more conscious of safety and emergency procedures. For instance, we should all be aware of the experiment power NOT-AUS (emergency-off) switch, located under the stairs to the counting room; also the emergency shutdown instructions for the muon chamber gas supply (in folder near counting room door, below PETRA monitor). Smokers, whatever their physical size or number, should be ruthlessly driven out of the Hall!

Next JADE-meeting 7/7/83

Austin Ball

Minutes of the JADE - meeting held on 23rd June 1983

- Agenda: 1) Results
2) Improvement Program
i) beam-pipe chamber
ii) pressure vessel
iii) z-chamber

1) Results

Lutz Becker presented his latest work on charged D* production.

2) i) Beam pipe chamber

Henning Kado reporting on the status of the beam-pipe chamber. Results from a 3 segment prototype, with flash ADC readout, are encouraging. The momentum resolution for (5 GeV) particles in JADE should, based on these results, improve from 10% to 2.5%.

The beam pipe and flanges for the new chamber are ready, and wiring will start next month. Preamps and line-drivers are under development and FADC production has started.

ii) Pressure vessel

Rolf Felst discussed modifications to a central section of the inner wall of the pressure vessel. Replacing the present 7 mm thick AL by 3 mm thick Be would halve nuclear interactions in the wall, and give a factor 1.4 improvement in momentum resolution.

Hans Rieseberg presented an analysis of forces on the joints in the proposed composite wall. These appear to be negligible, but a bending test should be done. Depressurisation involves considerable risk to the inner detector, and it was agreed that this should be postponed until after the highest attainable beam energy is reached. For financial reasons, the beryllium cylinder may be ordered this year. A decision will be made in the next few days.

iii) z-chamber

This will be ready at the end of this year, but the installation should obviously also be postponed if, as previously assumed, depressurisation of the inner detector is required.

However, Hans Rieseberg described a possible method of extracting the pressure vessel without losing pressure! The supply pipes would be simultaneously cut and sealed, then fitted with valves. To accomplish this amazing feat, special tools will have to be designed and built. Special personnel will include vudu medicine men, a re-incarnation of Merlin, and a gang of apprentice sorcerers.

Next JADE-meeting: Thursday 30th June

Austin Ball

Minutes of the JADE meeting held on 16th June 1983

- Agenda:
- a) Present Run
 - b) Conferences
 - c) Data Reduction
 - online
 - offline

a) Present Run

Combined hardware and software errors in PKR cause the recent discrepancies between stated and real beam energies. Approximate corrections have been implemented online and offline.

Beate Naroska initiated a discussion of possible options for the remainder of this year's running. The major constraints are:

- fixed linac/synchrotron shut-down 8th - 22th August
- time needed to install remaining 20 cavities - 6 weeks
- time needed to commission machine with new cavities - several weeks?
- possible need for 1GHz system at higher energy, development time for this is uncertain
- remaining (1983) money for running machine (about 12 weeks worth)

It was agreed that our previous policy of pushing for the highest energy as soon as possible, should be continued.

b) Conferences

Details of the forthcoming conferences at Brighton and Cornell are available from Rolf Felst. Responsibilities for topics from JADE for Brighton were decided.

c) Data Reduction

(i) online

Howard Mills gave a general outline of online data reduction in the NORD system, and presented the specific example of a routine he has developed to reduce cosmic background in the 'J.O.' trigger, using fast muon search procedures based on T3 trigger streets. This is now operational.

(ii) offline

Barry Whittaker gave a detailed account, supported by a set of circulated notes, of the 'AUTORED' system which handles the massive task of data reduction and associated tape handling, at Rutherford Appleton Laboratory.

Next JADE meeting 23/6/83 15:00

Austin Ball

Minutes of the JADE Meeting Held on 9th June 1983

- Agenda: 1) Present run
 2) Miscellaneous

1) Present run

H. McCann presented results on μ -inclusive multihadron events in the present running period.

The latest information on R, from Prof. Söding, is that there is no significant structure (yet) when the experiments combine their results.

2) Miscellaneous

R. Felst asked us all to take more care to be sure of the day on which night shifts (00⁰⁰ - 08⁰⁰) are scheduled. The night is always that associated with the preceding day, even though it really is the "morning" shift of the current day. Thus, it has been known for people to think they are on night shift during the night of the day after the one where they really should have been on shift ... if you see what I mean. (Did I hear someone say "confusion"?)

Next JADE meeting: 16th June 1983

Hugh McCann 14.6.1983