

Olsson

MINUTES OF THE JADE MEETING
27/3/86

- Agenda 1) Current run
 2) Search for new particles

1) Current run.

Wulf Bartel summarised the state of the (then) current run: TASSO is working again, their magnet having been easier to repair than had been feared; ten out of the twelve sectors of Mark J's TEC are working; all four experiments complain of high background. The IBM-experiments link for data transfer was expected to be down this morning (Tuesday), but since our magnet was due to be serviced on Tuesday morning this does not affect us.

A request from the R-group: the tape archive is nearly full, please free archive tapes! Wulf and Jan Olsson will look into the question of whether we can delete, e.g., old REDUC1 backups.

Jan Olsson gave the current status of the Campaign for Less Deadtime. Over the past week a combination of faster FEP software, a better CAMAC interface and a found and removed bug in the NORD-10 software has enabled the buffered readout to be installed. As a result deadtime is now down to "only" 20% at the beginning of a fill. This is a considerable improvement on last week's figure of 35% ... congratulations!

2) Search for new particles.

Sachio Komamiya explained that this (unforeseen) meeting had been called to enable him to describe a search for the "non-standard axion", this being apparently something that theorists invented to explain an e^+e^- mass peak in heavy ion collisions at GSI when J/ψ and Υ decay results ruled out the "standard" axion. The relevant channel is $e^+e^- \rightarrow a + S$ via Z^0 decay, where a is this thing and S is its scalar partner ($S \rightarrow aa$). Sachio looked for this in the case where one of the a 's decays in the detector (into e^+e^- , it's too light to do anything else) and the other two escape unseen. One candidate event is found, leading to a rather weak upper limit.

Next JADE-meeting 3/4/86

S. Cartwright 1/4/86

O. Brown

MINUTES OF THE JADE MEETING
20/3/86

- Agenda 1) Current run
 2) AOB

1) Current run.

There was no current run: Rolf Felst recounted the sad tale. A mechanical digger managed to dig up three 10 kV cables this morning, causing

- (1) a brief power cut (less than a second), which killed off the DESY IBM and the Rutherford link computers temporarily;
- (2) damage to a power line supplying the South Hall transmitters, thus limiting PETRA to 16.5 GeV per beam;
- (3) severe damage to the TASSO magnet (short to ground).

Consequently, there will be no beam before 18.00 tomorrow (Friday). Shift crews should check the gas and hardware room temperature every four hours. Beam will re-start on Friday evening, at 17.5 GeV if the transmitter power supply is restored, or at 16.5 GeV otherwise. No decision has yet been made on what to do about the TASSO magnet.

Meanwhile, back at the counting house, the Campaign for Less Downtime continues, but no great successes have been recorded since last week. A significant reduction was however achieved at the end of last week by improved beam conditions (our version) or redistribution of the available background amongst the other experiments (PKR's viewpoint). Apparently good conditions can be achieved for us *or* Mark J, not both, so the experiment that complains louder wins. So ... shift crews, be aggressive!

2) AOB.

Beate Naroska said that the Easter shutdown, which starts next Thursday evening, is due to end the following Tuesday at 08.00. However, Rolf Felst said that our magnet will be overhauled that day, so we will not be able to switch on till later.

Richard Hedgecock appealed for a cleaner counting house. Shift crews, please take your coke bottles, stale sandwiches, plastic bags etc. with you when you leave.

Howard Mills said that a new (TEXed) version of the JDAS manual will be released soon (probably Monday). It is 20% shorter than the old one so you will be able to read it that much more quickly (yes, that is a hint!).

Next JADE-meeting 3/4/86 (that's in *two* weeks' time)

S. Cartwright 20/3/86

O. Hasan

MINUTES OF THE JADE MEETING
13/3/86

- Agenda
- 1) Current run
 - 2) Jets in tagged $\gamma\gamma$ interactions

1) Current run.

Eckhard Elsen reported on the continuing saga of the high deadtimes (40% in conditions which in 1982 produced 9%). He summarised the differences between JADE '82 and '86: basically, more triggers (but not when we use the RED-TR option, which is most of the time these days), the vertex chamber, the flash ADCs and different beam conditions (more electron tracks can be seen in the inner ring of the jet chamber). Various measurements have been made, but nothing stands out as a potential cure (the double buffering trick produced some improvement at low currents, but not at the beginning of a fill). Basically the system just cannot stand a raw trigger rate of 10 Hz. Howard Mills suggested that the next step is to conduct a detailed study of the rates from individual triggers to try to locate the source of the high rate. As the luminosity is not materially higher than in 1982, and as with RED-TR we do not have the "new" triggers in, it seems apparent that the extra rate is not physics.

In a lighter vein, Howard Mills discussed the effects of static electricity in the JADE counting room. These were especially noticeable in the recent cold dry weather, and consist mainly of devices (the Gould, the JDAS terminal and the YSPY terminal) hanging up for no obvious reason. The cure is normally to switch the offending machine off and on again.

Susan Cartwright complained that shift crews do not always log problems in sufficient detail to be of use to the relevant expert. Howard Mills said that he has also noticed this. *Please*, shift crews, take another 30 seconds to write down the *symptoms* of your problem, rather than just saying that a problem exists! (Also, remember to make a note if you solve it yourself!)

The particular problem in this case was inability to reset the z-chamber. For the record, this may occur if

- (1) the inner detector has not been reset (since an inner detector fast trip *causes* a z- and vertex-chamber trip).
- (2) the reset instructions were not followed correctly (this really includes (1) above, since the first instruction is "Reset the jet chamber"!), or were followed too slowly (this results in the chamber run-up starting before the alarm has been cleared, thus causing another alarm).

To reset the z-chamber without switching the HT back on, switch the chamber off in the hardware room (press HT OFF on control module) before resetting the alarm in the rucksack.

2) Jets in tagged $\gamma\gamma$ interactions.

Alex Finch presented the status of his study of hadron production on two-photon interactions. Most of the data are in good agreement with the Wriedt VDM Monte Carlo, but the parameters of this model were optimised to fit very similar (lower statistics) data anyway. The contribution of the quark parton model is, however, visible at high jet p_T .

More interesting were the results which Alex obtained when looking for the excess of non-jetlike events at high p_T -of-the-thrust-axis seen at lower Q^2 by the PLUTO group. Somewhat to Alex's surprise, this excess can also be seen in our data. The interest lies in the fact that the invariant mass distribution of these excess events shows a clear peak at 9.5–10 GeV. The significance of the peak is about 4σ ; its interpretation is most unclear, since if it were η_b production the cross-section would be of the order of 700 times the theoretical expectation! Also it is not obvious that such a peak should be seen even if it were there (one would expect it to be smeared out by missing particles). More Monte Carlo studies are under way to investigate this question.

Alex is going to the Paris $\gamma\gamma$ conference in early April and suggested that these data should be presented there. The general feeling was that this would be acceptable provided that the Monte Carlo resolution studies could be completed in time.

Next JADE-meeting 20/3/86

S. Cartwright 14/3/86

MINUTES OF THE JADE MEETING
HELD 27/2/86

- Agenda 1) Present run
 2) Physics results

1) Present run.

Eckhard Elsen reported on the system monitoring the Flash ADCs processor, with emphasis on possible tasks the shift crew may be required to undertake to counteract error messages. In the event of a *J68K ERROR - SEE MOP* message appearing on the colour TV and/or continuing missing JETC Lams, we are asked to stop the run and to step over to the 'monitoring processor terminal' (which is clearly marked) and to reload the system using the JADEGO command. (Instructions are at hand.) Next, observe the Event Processor (EVP) terminal, situated nearby and wait 30 seconds for a message signalling the end of the calibration. If this does not appear, this could be due to a Nord crash or more likely, the trigger box has not been left in a well defined state, in which case the trigger box *RESET* button should be pressed and then the system loaded.

Hardware and software failures of the NORD have kept Jan Ollson fairly busy throughout the past week. When we have succeeded in taking data, the dead time has still been high, $\approx 40\%$ at run start even with reduced triggers, and we have been plagued with missing JETC Lams. Intracacies of the readout system were revealed by Jan in his attempt to solve these problems. Partial success in reducing the dead time was achieved by transferring the JETC and J68K banks to the end of the readout. However, following a suggestion by Beata Naroska, Jan has realistic hopes of reducing the deadtime to something no man has ever known before!

Following an inconsistency between the NORD50 PATRCH analysis and the M-16 T2ANA analysis, as reported last week, Howard Mills has since scanned events, which were flagged by the NORD and would normally have been rejected, to check that the NORD 50 analysis routines were functioning correctly. Howard found that all was well and the NORD 50 track filtering algorithms have been put back into service.

Luminosity figures from Petra are: Jade 0.7 pb^{-1} , Tasso 2.1 pb^{-1} , Cello 1.2 pb^{-1} and Mark J, hardly any at all due to severe problems with their vertex chamber.

Last but not least, we are requested (demanded of?) by an internal inspection group consisting of safety people, medical staff, union representatives etc. to keep the counting house clean. Oh, and we need a bigger toilet too!

2) Physics results.

Beata Naroska reported on the hardware performance of the TOF counters. Their efficiency has steadily fallen over the years, from almost 100% to around 96% in 1985. The fall can be largely attributed to a corresponding increase in the TOF thresholds. For the start of 1986, the thresholds have been reduced by 30% compared with last year and Beata hopes to reduce them even further. The time resolution is also seen to fade with the years. In 1985 the resolution was about 0.5 ns .

Last week Uwe Schneekloth reported on the 1985 tau pair analysis. This week Beata reported on the 1985 muon pair asymmetry results. At $\sqrt{s} = 43.58 \text{ GeV}$ the asymmetry is

- $(16.3 \pm 4.5)\%$, which at face value is in perfect agreement with the standard model. However at the lower 1985 energy, $\sqrt{s} = 38.04$, the asymmetry point is around zero. Regular readers of the Minutes will note that at this energy point, Uwe reported a positive tau asymmetry! While Beata remains open-minded as to whether or not this is some new physics, her motto remains the same: 'nature is always wanting to teach us a lesson in statistics!'

When including all the $\sqrt{s} = 38 \text{ GeV}$ data, the deviation from the standard model becomes less significant.

Karl Heinz-Hellenbrand reported on his search for 'the Mark J low thrust ($T < 0.8$) isolated muon ($\cos\theta < 0.7$) effect' but using inclusive electrons. At $\sqrt{s} > 46.3 \text{ GeV}$ and for electrons above 1.8 GeV he sees no events and expects 0.5.

Michael Kuhlen presented the results using muons once again with further checks to ensure the background from synchrotron radiation was not higher above 46.3 GeV than it was below this point during the scan. In the region of interest he sees 5 events and expects 0.56. By comparison Mark J see 8 and expect 2. A Jade Note by Michael and Karl-Heinz is in the print.

Michael and Beata will be presenting their respective results at Moriond.

Next JADE-meeting 6/3/86

J. Chrin 28/2/86

Olson

MINUTES OF THE JADE MEETING
HELD 20/2/86

- Agenda
- 1) Present run
 - 2) First reducone data of '86
 - 3) Physics results

1) Present run.

The 1986 run began surprisingly well, with data being recorded at $E_{cm} = 35\text{GeV}$ within a week of Petra starting up. However, a few problems in the counting house have arisen which were summarised by Howard Mills.

The control of the magnet by computer is inoperative. In addition the magnet is unstable and the current prone to large fluctuations. Some test runs do not work (muon test run for one). This of course is not critical, but rather worrying since it is not known why. The dead time is high ($\approx 30\%$). Some detective work by Howard and Henning Kado pin-pointed this to the inner detector read-out. Hans von der Schmitt was able to confirm this. The standard read-out pattern appears to be overwritten once in a while. There are problems with YVOLTS. And last but not least the z trigger is not included in the read-out.

Some new features in the read-out include a new jet chamber bank J68K which follows the JETC data in the read-out. The bank, containing error flags, is examined by the NORD 50, which upon spotting an error, displays the following message on the TV monitor: J68KERROR - SEEMOP-. Shift personnel should inform a jet chamber expert.

Howard also warns us that the YSPY program still talks in terms of DL8's. Consequently it'll take a few DL300 failures before YSPY will notice. It may therefore be a good idea if shift crew were to check the wiremap a little more frequently.

Regards the on-line filtering. The T2ANA and z vertex finding routines are active in th M-16. Likewise the NORD 50 is performing its' usual on-line analysis and 'flagging' the events as they go by. However Howard observes an inconsistency between the NORD50 PATRCH analysis and the M-16 T2ANA analysis, which will require checking off-line.

2) First reducone data of '86.

Lutz Becker informed us that the first data of 1986, at the reducone level, is already available. Data set names are:

JADEPR.RED11H.ST066 Run 24212 Events 169
JADEPR.RED11H.ST067 Run 24213/4 Events 174
JADEPR.RED11H.ST068 Run 24215-26 (only just out)

Further information is available on JADEOL.REFORM.S(Runlist5).

3) Physics results.

Uwe Schneekloth summarised his results of an analysis of the 1985 τ data sample. Only the asymmetry results are given here.

$$\langle s \rangle = 38.04\text{GeV} \quad A = +(4.3 \pm 6.9 \pm 1.0)\% \quad A_{GSW} = -11.1\%$$

$$\langle s \rangle = 43.58\text{GeV} \quad A = -(18.2 \pm 5.5 \pm 1.0)\% \quad A_{GSW} = -15.5\%$$

More comparisons of distributions from data with QCD model calculations, from Siegfried Bethke. This weeks' distributions were acoplanarity and the Q plot. Siegfried gave further detailed evidence of the failings of perturbative QCD models in describing the 4 jet rate in the data. When unfolding the number of jets from the cluster searches in the data to the number of partons produced, enabling a direct comparison to be made between the 'unfolded data' and the perturbative prediction, the discrepancies become larger. Siegfried concludes that the Lund model, in order to describe the data, needs a factor of 1.5 - 2 more 4 jet events, 20 - 30% less 3 jet events and also a factor of 1.5 - 2 more 2 jet events.

An interesting observation was the correct description of the data in the ratio of 3 to 4 jet events, by the Webber cascade model. (The Lund fails in this respect.) Nonetheless the Webber model still generates far too few 3 jet events when compared with data.

Next JADE-meeting 27/2/86

J. Chrin 21/2/86

Alma

MINUTES OF THE JADE MEETING
HELD 13/2/86

- Agenda
- 1) Petra latest
 - 2) Vertex chamber calibration
 - 3) Physics results, and plenty of 'em at that!
 - 4) Miscellaneous
 - 5) When an old cricketer leaves the crease

1) Petra latest.

Shifts are now due to start on Friday 14.2.86. The delay of one day was caused by the switching off of 110kV power lines which were too close to the Hera tunnelling machine for comfort. This effectively meant that Petra was unable to accelerate the beams. At 7 GeV however, 5 mA per bunch was achieved although the vacuum at Mark J and Jade was rather bad. Shift personnel over the weekend should check with PKR as to whether the magnet is to be switched on.

2) Vertex chamber calibration.

Klaus Kleinwort gave a status report on the vertex chamber calibration, which included calibration of the FADC clocks and the chamber position relative to the inner detector. The average drift velocity, v_d , and t_0 for each wire was determined to be:

$$\langle v_d \rangle \approx (49.7 \pm 0.1) \mu m/ns$$

$$\langle t_0 \rangle \approx (16.3 \pm 0.3) ns$$

The resolution of the homogeneous section of the chamber in $r\phi$, as determined from good bhabha barrel events is $\sigma_{r\phi} = (126.0 \pm 0.5) \mu m$.

Problems in the inner detector calibration were evident when matching vertex chamber tracks with jet chamber tracks. Ring 3 of the inner detector is the suspected cause and we'll be hearing more on this in a fortnight or so.

3) Physics results.

Lutz Becker presented new results in his analysis of ι (iota) production in e^+e^- fragmentation. The channels investigated were:

$$e^+e^- \rightarrow \iota + X$$

$$\iota \rightarrow \delta\pi$$

with the delta decaying into two kaons such that the final state was either

$$(K_s^0 K^\pm) \pi^\mp \quad (a)$$

$$(K^+ K^-) \pi^0 \quad (b)$$

13 and 53 candidate events of type (a) and (b) respectively were found, leading to cross section \times branching ratio figures of:

$$\sigma(e^+e^- \rightarrow \iota X) \cdot BR(K_s^0 K^\pm \pi^\mp) = (10.1 \pm 2.8 \pm 3.0) pb$$

$$\sigma(e^+e^- \rightarrow \iota X) \cdot BR(K^+ K^- \pi^0) = (6.7 \pm 1.7 \pm 1.8) pb$$

For a spin 0 iota the branching fraction ratio, $\frac{K^0 K^+ \pi^-}{K^+ K^- \pi^0}$, is expected to be 2.

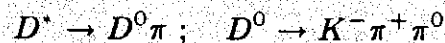
Tim Greenshaw presented results on recent work, undertaken with Roger Barlow, on the determination of the quark-antiquark forward-backward (sideway?) asymmetry when summed over all quark flavours. Extending a method pioneered by Peter Warming, Tim uses the four fastest particles (i.e. with highest rapidity) of each jet to determine the charge of the jet. The combined asymmetry over all flavours is determined to be $-(0.149 \pm 0.015)$, somewhat higher than the expected figure of ≈ -0.06 . When separating the charged $\frac{1}{3}$ and $\frac{2}{3}$ contributions the resulting asymmetries are:

$$A(\frac{2}{3}) = -(0.24 \pm 0.07)$$

$$A(\frac{1}{3}) = -(0.47 \pm 0.32)$$

Some systematics which may give rise to a higher asymmetry were investigated, but Tim is still after suggestions. One discouraging aspect is the failure of the Lund Monte Carlo in describing the rapidity distribution of the data.

Now some physics results from across the North Sea. Susan Cartwright presented a beautifully separated D^* signal as discovered by John Nye at Lancaster. The channel used to tag the D^* was the standard



What makes this signal different from any other however, is that it was picked up in two photon processes, making it another first for Jade (nice one John, let's have another one!) Susan will be presenting this result to the PPESP (Particle Physics Experiments Selection Panel) at Rutherford in a few days' time.

4) Miscellaneous.

Rolf Felst asks that visitors to Jade should make themselves known to Frau Platz so that she is able to forward messages etc. that invariably arrive for them during their stay.

5) When an old cricketer leaves the crease.

When an old cricketer leaves the crease, having scored a half-century, celebrations and best wishes inevitably follow. Tim Greenshaw humorously announced the 50th birthday of Richard Hedgecock. When asked how he manages to keep looking so young, Richard revealed his secret was regular training on the football field, good wine, Camay soap and the Dubliners! Happy Birthday Richard, from us all!

Next JADE-meeting 20/2/86 (I presume)

J. Chrin 14/2/86

Olsson

MINUTES OF THE JADE MEETING
23/1/86

- Agenda
- 1) Status of the flash ADCs
 - 2) Start-up schedule
 - 3) AOB

1) Status of the flash ADCs.

Eckhard Elsen reported that the inner detector is working again — cosmics have been seen — so JADE lives in '86!

The "mock DL8" format from the DL300's is not perfect. and Eckhard summarised the main changes, which are as follows:

- 1. There is a new drift time unit, being 1/64 of a DL8 unit, or 117 ps. The range of valid drift times is $0 < t < 64 \times 2.56\mu s / 7.5ns \approx 22000$.
- 2. The time zeroes have changed: an approximately correct value is known but beam-beam data will be required for a proper determination.
- 3. The amplitudes A_L , A_R were different from those produced by the DL8's, but have been rescaled to agree to within about 20%. The valid range is $0 < A < \infty$, not 4096 as before.
- 4. Amplitude pedestals are now subtracted online. This affects the online display which used to subtract a nominal pedestal of 50.

It is clear that these changes affect data validation routines in the online system and elsewhere in the chain (REFORM? REDUC1?). Howard Mills pointed out that they may also affect the online rejection in both the MIPROC (T2 check) and the NORD (fast pattern recognition), and also presumably the event marking from the FAMP. In view of this it will probably be necessary at the start of the new run period to disable rejection by those programs using inner detector data until checks have been carried out offline. (This does not affect routines such as MUTANA and the noisy lead glass block spotter.)

2) Start-up schedule.

Rolf Felst presented the current schedule for PETRA start-up, namely:

- 31/1 Close PETRA ring: check interlock
- 6/2 Close experiments
- 7/2 Check interlock
- 8/2 Check mini- β
- from 10/2 Start tuning PETRA
- from 13/2 Experiment magnets must be ready
- from 17/2 Luminosity!

Shifts will therefore be scheduled from the 13th, though the first few may not be needed.

3) AOB.

John-Arthur Skard thanked all those people who commented on his $\gamma\gamma \rightarrow p\bar{p}$ paper. The QCD curve was omitted from the angular distribution shown in that paper; it's in now; it doesn't fit the data but then it wasn't expected to.

Rolf Felst remarked that Brian Webber of the Webber Monte Carlo is coming to DESY for two weeks in early April. Keen Monte-Carloers thus have two months to formulate their questions!

Next JADE-meeting 6/2/86

S. Cartwright 24/1/86

Chrin

MINUTES OF THE JADE MEETING
HELD 9/1/86

- Agenda
- 1) Petra and Jade Latest
 - 2) 1985 Reducone data
 - 3) Webber and Lund models may work well together?

1) Petra and Jade latest.

Petra is scheduled to return to life in mid-February, although luminosity is not expected until 2 or 3 weeks after. Meanwhile over in the Jade hall, the installation of the flash ADC's is almost complete and the first cosmic test runs are expected to start fairly soon (approximately the 17th).

2) 1985 Reducone data.

Lutz Becker announced that the 1985 Reducone data sets are now available:
Run #20000 to 24187 corresponding to generations:
Gen #957 to 1243 (i.e 287 tapes)
Filename: JADEPR.REDUCONE.GXXXXV00
where XXXX is the generation number.

3) Webber and Lund models may work well together?.

Sachio Komamiya presented his results on an attempt to combine the QCD parton cascade model (Webber) with the QCD exact matrix element (Lund $O(\alpha_s^2)$). The gross structure of an event was obtained using the exact matrix element while the detailed structure incorporated the LLA parton cascade. Good agreement was found with the data for the energy energy correlation distribution. Despite the promising result, it was pointed out that theorists won't like this idea of combining the two models. Much discussion followed but Sachio was not deterred!

Next JADE-meeting 23/1/86

J. Chrin 13/1/86