

Olsson

MINUTES OF THE JADE MEETING
HELD 21/11/85

- Agenda
- 1) Progress report on the installation of the FADCs
 - 2) Moriond 86
 - 3) Tests of the 2nd order QCD matrix element
 - 4) Miscellaneous

1) Progress report on the installation of the FADCs.

The title says it all! Herr Rieseberg reported on the progress made, both in Heidelberg and in the JADE hall.

2) Moriond, 9-16 March 1986.

The subject matter of next year's Moriond workshop is "Perspectives in electroweak interactions and unified theory." Anyone interested in a nice holiday?

3) Tests on the 2nd order QCD matrix element.

Perturbative QCD Models (i.e. Lund, Ali, Hoyer) versus QCD Shower Models (Weber, Gottschalk) - Round 12.

Siegfried Bethke reported on the latest battle between these Monte Carlo giants. However the outcome of this latest meeting sprung a few surprises, so read on.

Siegfried discovered distributions (namely $Y(\min)^1$ and $\Theta(\min)^2$) which were insensitive to parameters of the different fragmentation models. These distributions were then used to test the QCD three jet matrix element. It was found that the Weber model fits the data with respect to these distributions best of all. This is surprising since QCD shower models do not contain the full three-parton matrix element and consequently predict less three jet events than seen in the data. Additional perturbative QCD 3 jet events are therefore not required by the Weber model in this respect. The expected effect of the missing 3 jet events is however evident in the Gottschalk model, which, like the perturbative QCD models (and also Lund with Gottschalk matrix element incorporated) fails to describe these distributions in the data.

These observations led to much discussion and left many open questions. Astute observers noted however, that if our Monte Carlo were to consist of 50% Webber and 50% Lund (with Gottschalk matrix element) we would then get good agreement with the data!

4) Miscellaneous.

The latest head upon which the "JADE doctor's hat" falls upon is Dr Uwe Schneekloth. Celebrations immediately followed the meeting courtesy of Uwe. Similar fates within the last fortnight were met by Drs Tim Greenshaw and Paul Hill. Congratulations to them all!

Next JADE-meeting 05/12/85

Next JADE-party 16/12/85

J. Chrin 26/11/85

¹ $Y = m_{ij}/s$ where m_{ij} are the invariant masses between partons i and j

² Θ is the angle between any 2 axes in a 3 jet event

Olsson

MINUTES OF THE JADE MEETING
7/11/85

- Agenda
- 1) Current run
 - 2) Installation of the new tagging MC
 - 3) Mark J muons revisited
 - 4) AOB

1) Current run.

Herr Rieseberg reported that we now have several hundred spare DL8's for the z-chamber, and a lot of space in the hardware room.

Herr Krehbiel asked if it would be possible to move some of the vertex chamber electronics two racks to the left of its present position. Henning Kado felt that it was not, due to the restrictions imposed by cable lengths.

Meanwhile, the 7-cell cavities are being removed from PETRA, despite a last-ditch attempt by CELLO to change their minds. So it's going to be 17.5 GeV next year.

2) Installation of the new tagging MC.

Jan Olsson reported that Alex Finch's new tagging Monte Carlo routines have been installed in F22ELS.JMC.S/L as promised (threatened?) by Alex two weeks ago. As a consequence, users of the JADE MC must now link F11LHO.TAGG.L in their JCL, because one routine is picked up from there¹. Also, users should remember to set the commonblock COMMON/TODAY/HDATE(6), if they do not want the default (1982) tagging system configuration. This is all explained in Alex's JADE Computer Note 86.

3) Mark J muons revisited (or, would you buy a used muon from this man?).

Michael Kuhlen described his attempt to repeat the Mark J low-thrust inclusive muon analysis with the JADE high energy data ($\sqrt{s} > 46.3$ GeV). The result, surprisingly, *supports* the Mark J effect: we see 5 such events ($T < 0.8, |\cos \delta| < 0.7$) and expect only 0.75 from the lower energy data. This compares well with the eight seen by Mark J, given that they have almost double our luminosity.

Although four of the five events are in the (background-ridden) endwalls, Michael claims that there is no evidence that the background was very much higher at this energy than at the energies just below. (The fact that these events are in the endwalls explains why they were not found at the time by Hugh and Chris — pushed for a quick result, they considered only the well-understood barrel muons.)

Michael showed pictures of all five events (which brings us to the subtitle above). Any helpful comments/suggestions/ideas welcome!

¹If you have D lows in the queue, don't panic ... the offending routine has been TEMPORARILY copied to F22ELS.JMC.L. However, it will not remain there long!

4) AOB.

Howard Mills pointed out that with only 45 shopping days to Christmas, the subject of the JADE Christmas party rears its head again. The proposed time and place is now

Monday Dec. 16, 20.00, JADE meeting room

A party (and price) similar to last year's is envisaged.

Next JADE meeting 14/11/85

S. Cartwright and half a million 'flu viruses. 8/11/85

MINUTES OF THE JADE MEETING
31/10/85

- Agenda
- 1) Current run.
 - 2) Status of the vertex chamber analysis
 - 3) AOB

1) Current run.

Rolf Felst reported, after his arrival at 15.05, that PETRA is currently running at 17.5 GeV for machine studies. Also, Energy Saving Time begins tomorrow (no beam from 7-9 and from 16-18 weekdays — i.e. on Friday only!). We currently have some fairly major problems with the lead-glass HT system, and it is hoped that a Tokyo person will be exported from Geneva tonight or tomorrow in order to deal with this.

Meanwhile, the CELLO new inner detector has been found to be suffering from cracked feedthroughs and consequent HV breakdown, and will not be installed this shutdown. If further investigation shows that the problem can be solved within three months, CELLO will remain out of the beam after the shutdown and will return (complete with new inner detector) at Easter. Otherwise the new inner detector will presumably be placed in the storage space until recently occupied by the new PLUTO inner detector (now disposed of to the Eastern bloc)!

The Mark J Time Expansion Chamber, on the other hand, is presently sitting in the DESY test-beam, and *will* be installed in Mark J. Early results look very impressive.

Finally, Jan Olsson produced some campaign literature for the JO and HK triggers. The recent high currents and consequent high rates have led to unacceptable dead-time, and these triggers are the first casualties (the shortened command is RED-TR). However, despite the opinions of certain one-photon Philistines, these triggers do produce physics — Jan showed a beautiful η' signal from the JO2 trigger. Consequently, shift crews are asked to *please* try to switch these triggers back on in the latter half of the fill, when the deadtime has decreased.

2) Status of the vertex chamber analysis.

Rainer Ramcke reported on the recent progress in the vertex chamber analysis. Thus far, 21.4 pb^{-1} of data have vertex chamber data (including a small quantity of data with non-standard HT settings). The space resolution has been measured using Bhabhas to be $\sim 130 \mu$. Since the sagitta for a particle of 500 MeV is less than this, vertex chamber tracks can be treated as straight lines to all intents and purposes. An efficient pattern-recognition algorithm has been developed (only 0.8 tracks/multihadronic event are not found, usually because they have less than four hits) and work is progressing on linking the tracks to inner detector tracks. So far, this can be done for high energy tracks, but difficulties arise for low energy tracks where multiple scattering in the jet-chamber wall is important. The mean difference between the vertex chamber track position and the extrapolated jet-chamber track is 280μ for these high energy tracks. The total vertex chamber analysis takes about 20 ms/event.

3) AOB.

Hanns Krehbiel asks who left a length of heavy chain in the second-Nord room. Wulf Bartel denies that it is the anchor chain from his boat!

Olson

MINUTES OF THE JADE MEETING
HELD 24/10/85

- Agenda
- 1) Current run
 - 2) IBM PC error messages
 - 3) JDAS latest
 - 4) Z chamber status report
 - 5) New tagging system Monte Carlo

1) Current run.

As from 31/10/85, for a period of 2 to 4 shifts, Petra will undergo machine tests to determine if we are able to run at 17.5 GeV using the present machine optics. We shall nonetheless continue to take data, background permitting.

2) IBM PC Error Messages - and what to do with them!

Peter Petersen reported on the vertex chamber error messages that may appear on the JDAS colour terminal.

a) IBMPC inactive? This means that the PC is not monitoring the vertex chamber. This may be because a vertex person is actually logged on to the PC, or alternatively, the PC has suffered a "hang up" in which case we are asked to switch the PC OFF, count to 10, and then switch it back ON again.

b) BP-CH TRIP or H/W error? This error message is already familiar to the shift crew and is almost always due to a vertex chamber trip. Reset the chamber in the rucksack and note what quadrant caused the trip.

c) BP-CH error found. The PC has found something wrong with the vertex histograms. If you feel confident enough you may look at the histograms on the PC yourself by following the instructions in the vertex chamber manual. Otherwise just press the appropriate key on the PC to turn off the alarm.

Should any of the above error messages appear, they should be noted in the log book. A report on how the above system has worked out so far, will be given in next week's meeting.

3) HM on the HK trigger plus how JDAS is performing.

Howard Mills reported on the background to the recently installed Hanns Krehbiel trigger. Howard has managed to reduce the read out rate to the IBM by about 75% by rejecting events which were triggered by a certain noisy lead glass block and by searching for cosmics.

Howard also reported that since the change to lower energy the NORD 10/50 and Camac are behaving well. Notable improvements are a reduction in the dead time from about 35% to 16%, less synchrotron hits in the inner detector (down from 160 to 50 hits per event) and consequently a better Plessey M16 rejection factor.

Howard also noted that the number of single lead glass block "events" has also increased this year due to ageing photomultiplier tubes.

4) Z chamber status report.

Susan Cartwright gave a detailed account of the performance of the z chamber after analysing 80,000 cosmic events collected in March 1985. Susan now hopes to provide a set of calibration constants for the multi-hadronic data fairly soon.

5) The new tagging system Monte Carlo.

Alex Finch informed us that the new tagging system Monte Carlo has been tested and approved. Full details appear in Jade Computer Note 86 which is already awaiting collection from your pigeon holes.

Next JADE-meeting 31/10/85

J. Chrin 31/10/85

MINUTES OF THE JADE MEETING
17/10/85

- Agenda 1) Current run
 2) AOB

1) Current run.

The current run is producing one logbook page per four days (X + Y on shift; gas check done; A + B on shift; gas check done; ...). Although Mark J have concluded that their muon asymmetry anomaly was not real (to nobody's great surprise), it is agreed that we will remain at this energy for the rest of this year's running. Next year Leneke and the directors recommend removing all 7-cell cavities to run at 17-17.5 GeV as in 1981-82. Rolf Felst and Ronnie Rau of Mark J tried to convince them to leave some 7-cell cavities in and run a little higher, but to no avail.

2) AOB.

Jan Olsson proposed another new T1 accept trigger (for which he and Hanns Krehbiel each blame the other). It combines a barrel septant with an endcap quadrant (with TOF veto) and could detect $\gamma\gamma \rightarrow \eta$ with non-zero Q^2 . It also detects, rather efficiently, cosmics and noisy photomultipliers, and preliminary tests produced an intolerable trigger rate of 1-4 Hz, depending on threshold. However, offline tests suggest that a slight change in the logic (requiring *exactly* one quadrant rather than at least one) will give a reasonable rate after Nord-50 cosmic rejection. Jan therefore proposed that the necessary modifications be made to the trigger logic to enable this to be tested online for the remainder of this run-period. This was agreed.

Next JADE-meeting 24/10/85

S. Cartwright 17/10/85

MINUTES OF THE JADE MEETING
HELD 10/10/85

- Agenda 1) News on Petra
 2) The Day of The Flash ADC's is nigh!

1) News on Petra.

With Petra now operating with a beam energy of 19.140 GeV, the luminosity is more than 50% higher and we are collecting about 350 nb^{-1} per day.

The decision arising from the closed PRC meeting was that Petra is to run at low energy next year. Whether this will be 34.5 or 38 GeV or somewhere in between has not been decided.

Petra will re-start in the new year on the 14th February still using DESY I as injector.

2) Flash ADC readout for the inner detector.

The installation of the new readout system for the jet chamber will start this coming shut-down. A full account of the present status of the preparations was given by a number of speakers. After an introduction from Albrecht Wagner, Guenter Eckerlin presented results from tests on the Jade prototype. Joseph Spitzer discussed the implications of the new readout to the calibration. Peter von Walter reported on the status of the hardware. Eckhard Elsen gave details of the microprocessor readout and Herr Rieseberg displayed the time schedule for the installation. Finally, Jan Olsson showed how he and Howard Mills would develop the Nord software to combat the impact of these DL300's.

The main virtues of the new readout system are an improved $r\phi$ resolution (from 170 to $110\mu\text{m}$, corresponding to a 35% improvement in $\Delta p/p$) and a better double track resolution (from 7 to 2.5mm). The z resolution is also expected to improve slightly while the dE/dX remains the same. Mammoth details of the above appear in the minutes from 21/2/85. Just goes to show it's worth filing your weekly minutes!

Next JADE-meeting 24/10/85

J. Chrin 16/10/85

Olsson

MINUTES OF THE JADE MEETING
3/10/85

- Agenda
- 1) Current run
 - 2) Mark J strikes again ...
 - 3) AOB

1) Current run.

There was nothing to report on the current run: all seems to be well.

2) Mark J strikes again....

Rolf Felst reported the unveiling of another Mark J effect. This time they see oddities in the behaviour of the muon asymmetry as a function of the acollinearity of the muon pair. The "anomalous" behaviour is seen only in the energy range 37.9-38.8 GeV (from the energy scan back in the mists of time). It is barely significant statistically. The results from the other experiments in this energy range are not too extensive, as both CELLO and TASSO were suffering start-of-run problems: we have comparable statistics to Mark J and see nothing unusual. Nonetheless, Mark J would like to run at 38.28 GeV from now till the shutdown. The directorate have agreed to this "for fun" (Söding).

3) AOB.

Herr Rieseberg introduced Peter Igo-Kemenes, from Heidelberg. He is working on OPAL and will be here for three weeks to see a running e^+e^- experiment. It is hoped that the experience will profit both sides.

Next JADE-meeting 10/10/85

S. Cartwright 4/10/85

**MINUTES OF THE JADE MEETING
HELD 26/9/85**

- AGENDA**
- 1) Present Run
 - 2) Petra 86 :- Energy or Luminosity?
 - 3) Miscellaneous

1) Present Run.

Petra is now operating with a beam energy of 22.725 GeV. It was at this energy that "The Cello Event" was found.

2) Petra 86 :- Energy or Luminosity?.

Last Friday's "polite exchange of arguments" between the Petra experiments regarding the choice of Petra's future energy, ended inconclusively, with Cello and Tasso opting for 18 GeV and Mark J and ourselves preferring 22 GeV. However, when taking into account the feelings of the directorate, then there is a definite swing for the lower energy (Grrrr!). A letter of intention for the higher energy was written by Rolf Felst as requested by the directorate.

It was also discussed at the Jade meeting, that in the event of us losing the battle for high energy, we should then seriously contemplate proposing a beam energy of 7 GeV to enable a more accurate measurement of the total hadronic cross section.

3) Miscellaneous.

As diligent Jade members would have noticed, the last third of the published eta paper is not there! The blame falls onto the publishers who were quick to promise that the paper will be re-printed (in full!) in Physics Letters.

Next JADE-meeting 3/10/85

J. Chrin 2/10/85

MINUTES OF THE JADE MEETING
19/9/85

- Agenda 1) Current run
 2) E_{beam} for 1986

1) Current run.

Rolf Felst said that there will be a four-hour access for CELLO on Wednesday. Otherwise the machine is running well though the specific luminosity is low. PKR are aware of this and are trying to improve the situation.

Jan Olsson said that although the FAMP is now repaired, tests have shown that it causes a significant increase in deadtime. This is definitely due to the analysis program, as when FAMP is running a dummy program the deadtime goes back to normal. Jan therefore suggests that the FAMP should be left off until he can talk to Petri Laurikainen about this.

2) E_{beam} for 1986.

The current state of play as regards beam energy is that TASSO want to go down to 18 GeV, as do CELLO (to maximise luminosity with their new inner detector — they also want to keep PETRA going in 1987!), whereas rumour has it that Mark J will opt to continue at 22 GeV. After some discussion it was generally felt that nothing has really changed since the last beam energy debate, so since we went for 22 GeV then, we should in principle argue for 22 GeV again. On the other hand it is true that many people on JADE are working on topics which would benefit from higher luminosity (lifetimes, $\gamma\gamma$). Various people were seconded to attend a meeting with the directorate on Friday 20/9, to discuss the question.

Next JADE-meeting 26/9/85

S. Cartwright 21/9/85

MINUTES OF THE JADE MEETING

5/9/85

- Agenda 1) Current run
 2) Report on Kyoto conference

1) Current run.

Jan Olsson reported that he had installed a new trigger. This was proposed by Gus Zorn and consists of a tag plus a barrel septant plus 1 TOF counter and one track; it is related to the original Zorn trigger in much the same way as the two Olsson triggers are related. Its intended target is $\gamma\gamma \rightarrow \eta'$, where one of the scattered beam electrons is tagged. It collects about one (background) event every minute or so and, not surprisingly, has no effect on the deadtime. This trigger has been running since run 22587.

2) Report on the Kyoto conference.

Wulf Bartel summarised the news from the Kyoto conference — none. The standard model reigns supreme, all the collider oddities have gone away with increased statistics, the neutrino is not necessarily massive (some doubts were cast on the ITEP result, and the Simpson 17 keV neutrino is not confirmed by the Tokyo group), the proton hasn't decayed yet, and Cygnus X-3 does not emit muons (or whatever) in the directions of Fréjus and Kamioka.

MINUTES OF THE JADE MEETING

12/9/85

- Agenda 1) Current run
 2) AOB

1) Current run.

To a well-attended meeting (eight people—though twelve more did straggle in late!) Rolf Felst reported that though the current run is fine, the projected shutdown is subject to considerable modification. It seems that the major project, the switch from DESY-I to DESY-II, will not now take place for the simple reason that DESY-II is not working reliably enough for routine use. There are problems with phase instabilities in ramping the separately powered dipole and quadrupole magnets.

In view of this, the machine does not need a four-month shutdown, so the length of shutdown we need is determined by CELLO's installation of their new inner detector. If this were to take a very long time, it would even be possible to start up with CELLO still out: the new run might thus start as early as January. The stop date is still November 4, because we can't pay our electricity bill if we go on any longer.

2) AOB.

Rolf Felst said that there is a PRC meeting on October 4-5. There are no open presentations, but the beam energy question will be re-discussed, with TASSO arguing (again) for 18 GeV. The 'default' is presumably to remain at 22 GeV. Anyone with strong views should contact Herr Felst.

a discussion will be held at the next JADE meeting (19/9). It should be remembered that opting for 18 GeV with removal of the 7-cell cavities means a long shutdown and different machine parameters afterwards.

Hanns Krehbiel reminded would-be re-loaders of the Gould plotter that the paper tends to stick to itself at the corners, and the new pack should have its corners split up before insertion (by fanning it out a bit, flicking through it, etc.). Otherwise the plotter tries to eat three sheets at once, and gives itself indigestion.

Next JADE-meeting 19/9/85

S. Cartwright 17/9/85

MINUTES OF THE JADE MEETING
29/8/85

Agenda 1) Current run
 2) AOB

1) Current run.

Once again, there was no current run: this time a short to ground in one of the 10 kV power lines, resulting in a damaged 10 kV transformer. Repairs are expected to be completed late tonight and we may start running again tomorrow morning.

2) AOB.

Richard Hedgecock requested that shift crews be more explicit about what exactly is wrong with "unsatisfactory" runs (non-existent, died during pedestals, IBM data check error, etc., etc.). This information is needed to decide whether or not the REDUC1 program should attempt to process the run, and a wrong decision can result in a crashed REDUC1 job and two days' delay while Robin Middleton and Richard try to find out what happened. At present these runs are often simply not entered (or incompletely entered) in the log-book. This does not provide a good basis for a decision!

Karl-Heinz Hellenbrand reported that the Heidelberg multihadrons are now "ready for the next bug to be detected." The tape names for the newly re-processed (guaranteed free of known bugs) datasets can be found in JADE Computer Note 83.

Next JADE-meeting 5/9/85

S. Cartwright 29/8/85

MINUTES OF THE JADE MEETING
22/8/85

- Agenda
- 1) Current run.
 - 2) Results from the Zorn trigger
 - 3) $\gamma\gamma \rightarrow p\bar{p}$
 - 4) AOB

1) Current run.

There was no current run: Rolf Felst reported the sad story. It seems that because the iron piles (pounded in with much noise and vibration some time ago) are extremely expensive, they have to be removed now that the HERA buildings are capable of standing on their own four walls. The machine which does this exerts upward force on the pile and corresponding downward force on the surrounding ground. Unfortunately the water pipe for our magnet was under the surrounding ground, so it got squashed and, being plastic, broke. A power cable for PETRA runs parallel to our water pipe and is therefore also in danger.

The result of this is that PETRA has been switched off until all the piles have been extracted. This was due to be finished yesterday afternoon (Thursday). PETRA can then re-start, and the new water pipe has already been delivered, so we should not be long delayed. At the meeting it was envisaged that we might start running late today. In the meantime shift crews were doing the gas check plus a mid-shift inspection.

2) Results from the Zorn trigger.

Gus Zorn reported on his analysis of events from the Zorn trigger (tag plus barrel photon), which is intended to detect events of the type

$$e^+e^- \rightarrow e^+e^- \left\{ \begin{array}{c} \pi^0 \\ \eta \\ \eta' \end{array} \right\},$$

where the meson decays into $\gamma\gamma$ and one of the electrons is detected in the tagging counters. Requiring two photons of at least 200 MeV and a ≥ 13 GeV tag with cosmic rejection and p_T and acoplanarity cuts, Gus sees a clear π^0 signal of 20 events plus some indication of an η . The width of the π^0 is somewhat greater than MC expectations, possibly indicating a small beam-gas contribution: in the absence of substantial single beam or separated beam running, high statistics are required to get some estimate of the contamination. However, since Gus presently uses only 9.5 pb^{-1} of 1985 data, whereas the Zorn trigger has been installed for considerably longer, higher statistics can certainly be obtained. It is also possible that optimisation of the cuts could improve the acceptance, since the current cuts remove a substantial proportion of genuine events.

3) $\gamma\gamma \rightarrow p\bar{p}$.

Continuing the unusual emphasis on two-photon physics, John Arthur Skard presented the current status of his investigation of the reaction $\gamma\gamma \rightarrow p\bar{p}$. John Arthur returns to Maryland in the near future, but a draft of a paper on this subject will be distributed before he departs.

In this analysis the protons are identified by dE/dx , restricting the momentum range to $0.4 \leq \bar{p}_{p,\bar{p}} \leq 1.0 \text{ GeV}$. The major background is back-scattered protons from nuclear interactions: these are removed by various cuts on the vertex and on time of flight. After scanning and cuts on acoplanarity and net p_T , 63 events remain (from a luminosity of 83.5 pb^{-1}). About one third of these trigger "accidentally" due to TOF counters set by the annihilation debris from the antiproton, and these events are not used in the cross-section calculation. The final cross-section agrees within errors with the earlier TASSO result, but the angular distribution is significantly non-isotropic, tending to peak at $\cos \theta^* = 0$. TASSO said that their angular distribution was consistent with isotropy: it is, however, equally consistent with being peaked towards zero. QCD predicts the opposite behaviour, but it is already known from the overall size of the cross-section (and from theorists' caveats) that QCD is not applicable in this momentum transfer range.

4) AOB.

We still need more multihadron scanners. Volunteers to Michael Kuhlen please!

Next JADE-meeting 29/8/85

S. Cartwright 23/8/85