

Olsson

MINUTES OF THE JADE MEETING
12/4/84.

- Agenda
- 1) Announcements
 - 2) Search for spherical inclusive μ events
 - 3) Results on R
 - 4) Unorthodox models for $e^+e^- \rightarrow$ hadrons
 - 5) Other points

1) Announcements.

The DESY graduate lectures will be organised this year by F. Schrempp and G. Drews. The lectures are given in German: all interested people are welcome to attend.

The JADE magnet was scheduled to be moved at 8.00 a.m. today (Friday).

2) Search for spherical inclusive μ events.

Hugh McCann summarised the recent Mark J findings which have led to a reconsideration of last week's decision to remove the 1 GHz cavities, and described his search for similar phenomena in the JADE data.

At c.m. energies ≥ 46.3 GeV, Mark J find a relatively large number of inclusive μ events with low thrust ($T < 0.8$). They have 6 such events (including one dimuon) compared to a $udscb$ expectation of 1 and a $udscbt$ prediction of 13. No such excess is observed at c.m. energies below 46.3 GeV, and no step in R is claimed. Mark J do not claim that these events are to be interpreted as top production, but they do suggest that new phenomena are involved. There has been no confirmation of these results from the other experiments.

Hugh next detailed the steps that have been taken by the JADE collaboration to seek confirmation of the Mark J findings. Using the standard top analysis ($p_T^\mu > 1.6$ GeV, $T < 0.77$) one event is seen, as against an expectation of 0.35 ± 0.04 for five flavours and 9.22 ± 0.86 for six. This leads to a 95% confidence level upper limit on ΔR of 0.50.

Using a "Mark J-like" analysis ($T < 0.80$) 2 events are observed, after rejection of one where the "muon" is a fake caused by noise in the chambers. This is in perfect agreement with the expectation of 1.9 from $udscb$ or 1.8 from the data below 46.3 GeV. The expectation from $udscbt$ is 13 events. Hugh concludes that JADE have no evidence for new phenomena above 46.3 GeV.

3) Results on R .

Kawamoto gave the latest R -plots for the JADE data. No step or peak is seen in the overall plot, nor in the case where only events with sphericity > 0.15 are included. Selecting events lying in the "spherical" region of the Q -plot gives 5 events, compared with 42 from $udscbt$ and 1 from $udscb$: the latter figure comes from a Monte Carlo which does not include 4-jet events.

4) Unorthodox models for $e^+e^- \rightarrow$ hadrons.

Alfred Petersen summarised the state of several less well-known alternatives to Lund, Hoyer and Ali. These unorthodox models use a different parton generator (leading log approximation, with or without interference) and/or different fragmentation (cluster decay). Comparison with

various parameters of JADE 3-jet events shows that only Lund and Webber et al. (LLA + interference, cluster decay) describe the data well, and even Webber fails to account for the observed asymmetry of the energy-energy correlations.

5) Other points.

Chris Bowdery gave a hot-off-the-press account of a study of the high energy data using Robin Marshall's jet mass variable. Robin asserts that production of a high mass particle will lead to a peak in this variable at high values. No such peak is observed: a tail in the distribution extending to high jet mass is present to some extent in data at all c.m. energies and may be ascribed to 4-jet events. S. Bethke noted that in studies of the jet mass with Lund 5.2 (which includes 4-jet events), the highest jet mass values are indeed produced by 4-parton configurations.

In a preview of the JADE weird events exhibition (now postponed to next week), Hugh McCann showed an old but still unexplained specimen consisting of a two-jet system with a well-identified μ^+ within one jet and a highly energetic e^- emitted at a very large angle to the hadronic system. The electron is going in the wrong direction for a large angle tagged two-photon event. (Explanations on a postcard please to Dr H. McCann, c/o University of Manchester)

Next JADE-meeting 19/4/84

S. Cartwright 13/4/84

Wagner

MINUTES OF THE JADE MEETING 5/4/84

- Agenda 1) Current Run and Upcoming Shutdown.
 2) Miscellaneous.

1) Current Run and Upcoming Shutdown.

Rolf Felst recruited seven volunteers to start taking apart the experiment at 7:30 Monday morning when the shutdown begins.

Felst and Beate Naroska reported on the PETRA planning meeting. The 1 GHz cavities will be removed during the shutdown, but this will be done so that they can be put back in if the need arises. The polarization measurements have found that the beam energy is reproducible to 3 MeV. These measurements were made at 16 GeV, since at 22 GeV depolarization cannot be observed because of the beam position relative to the window. Polarization measurements will continue through today, and then PETRA will go back to 23.390 GeV/Beam, which will be the highest energy point scanned. Over the weekend, we will run at 23.315 GeV/Beam, which is the highest energy point with good luminosity and also corresponds to a high R value for several of the experiments.

2) Miscellaneous.

Felst reminded everyone that all JADE collaborators are invited to the HERA ceremony tomorrow, and that lunch will be served afterwards.

There was a general discussion about JADE searches for CELLO-type events. Everyone is encouraged to bring whatever weird events they have found to next week's meeting for an airing.

JADE has many results in draft form which should be presented at the Leipzig meeting, and abstracts are due in early May. It needs to be decided which of the JADE participants will present which results.

During the upcoming shutdown there will be many technicians from the various collaborating institutions working on JADE, and they all need to become acquainted with the DESY safety regulations. The list of regulations is available in English and German in Frau Platz's office, and each technician needs to read this and sign the list stating that he has done so.

Hanns Krehbiel reported that he has found abandoned food and faulty electronic modules in the JADE hall. The electronics need to be labeled so that EPOS knows what to fix, and so he reminded everyone again of the labels which should be filled in and affixed to all malfunctioning electronics. The week-old bread and yogurt are up for adoption.

Next JADE meeting 12/4/84

S. Wagner 5/4/84

MINUTES OF THE JADE MEETING
29/3/84

- Agenda 1) Current run
 2) Pretalks for the Blelefeld conference

1) Current run.

On Wednesday 28/3 the operating frequency of PETRA was reduced by 1 kHz. This should make it possible to do 3 or 4 more steps in the scan (before the frequency change we had already got down to a beam lifetime of one hour). After this we could further reduce the frequency to go yet higher in energy. The penalty for this is displaced beam orbits and therefore possibly increased background. TASSO is already suffering severely from this. We have had problems with high deadtime but it is by no means clear that the machine configuration is to blame.

NOTE that the PKR operators have a meter for our deadtime but will NOT look at it unless asked to do so. If they can be persuaded to notice it they can sometimes improve the situation — be prepared to insist!

The 1 GHz cavities are scheduled to be removed during the shutdown. However, it has been pointed out that up to now these cavities have not been running with the "best" klystrons, and that these "best" klystrons are scheduled to be delivered during the shutdown. If we do not remove the 1 GHz cavities and the new klystrons do work according to expectation we could gain 150–200 MeV/beam. But this costs lumi (maybe 30%) and we cannot then remove the 1 GHz cavities until the next shutdown in November. (Note that the removal is permanent, as to save time a sledgehammer approach is envisaged!) The decision as to whether to cancel the removal can be made up to the last day of running, and JADE's opinion is solicited. People with strong feelings on the matter should make them known to Rolf Felst as soon as possible.

The recent depolarisation studies do not appear to have lived up to expectation. Due to severe technical problems only two measurements were made, one before and one after the machine shifts. The machine people are not prepared to release the results officially yet — anyone who has not heard the rumour can get it from Beate. The conclusion is that if we want these studies done we have to give the machine people time to do it properly. There is also a shortage of personnel as some experts are leaving.

Wulf Bartel made an announcement concerning the shutdown.

THE SHUTDOWN STARTS ON MONDAY APRIL 9 AND AT LEAST 6–8 VOLUNTEERS ARE NEEDED AT 7.30 MONDAY MORNING TO START DISMANTLING THE EXPERIMENT!.

2) Pretalks for the Blelefeld conference.

Note that Sachio Komamiya's talk was postponed until Friday because his return from KEK was delayed. Karl Ambrus and Karl-Heinz Hellenbrand were scheduled to give revised versions of their talks on Friday as well.

Karl Ambrus outlined his search for heavy stable particles using the dE/dx measurements. From 25 000 events containing 400 000 tracks he has 3 surviving candidates after all cuts.

Lutz Becker (clearly D* of de show) presented his charged D* analysis. He has taken the lessons of last week to heart and all his π 's are now labelled as such (except for the two he forgot to change!). The results are compatible with other experiments.

Karl-Heinz Hellenbrand presented an analysis of inclusive electrons which he started last Thursday (which just goes to show that a week is a long time in high energy physics). The status of this talk will be decided on Friday.

Henning Kado gave a description of the new JADE vertex-chamber, with emphasis on the flash ADC readout, including a balance sheet showing exactly how much it has cost us. This talk is intended for the instrumentation session (the cost sheet may be suppressed).

Michael Kuhlen gave an account of the inclusive photon analyses, one using the lead glass and the other converted photons observed in the jet-chamber. The photon spectrum is almost entirely explained by the contributions from π^0 and η decays — we have half a photon per event left to account for.

Finally,

Alfred Petersen outlined his analysis of energy-energy correlations and their relevance to the choice of fragmentation model. The results for α_s in the independent jet model depend strongly on the method of energy-momentum conservation employed and can accommodate the findings of both MARK J and CELLO. The data, however, prefer the string model.

Next JADE-meeting 5/4/84

S. Cartwright 30/3/84

MINUTES OF THE JADE MEETING 22/3/84

- Agenda
- 1) Current run.
 - 2) Miscellaneous.
 - 3) Physics Results.

1) Current run.

Beate Naroska reported on the PETRA schedule for the next few days. Until midnight tonight, machine Q-shift measurements will be made. From midnight until 7 tomorrow morning, polarization studies will be continued. After solving various problems, a 40-50% polarization has been observed in PETRA and the beam has been depolarized. This needs to be repeated several times to determine the energy reproducibility. After the end of the polarization studies, we will go back and remeasure the point at $E_{BEAM} = 23.135 \text{ GeV}$, which all four experiments measure a high R value. After remeasuring this point, the scan will resume at $E_{BEAM} = 23.315 \text{ GeV}$, with the final scan point expected to be less than 23.5 GeV .

2) Miscellaneous.

The Deutsche Physikalische Gesellschaft begins the 2nd of April, so there needs to be a meeting scheduled for the pretalks.

Paul Söding has inquired as to the results of searches for CELLO-type coplanar $2 \mu - 2$ jet events in the other PETRA experiments. There should be a meeting in the next week or so of all those JADE members who are currently involved in searching for these events.

3) Physics Results.

Siegfried Bethke presented the results of his study of the fragmentation of heavy quarks. This was done in part to determine which values of fragmentation function parameters to use for generating Monte Carlo events. One strong conclusion of this study was that x_E is not equivalent to z , and should not be used as such. This fact has caused much confusion in published results from various experiments. Values of ϵ and \bar{x}_E for Peterson-type fragmentation functions can not simply be extracted from fits to x_E distributions and then used as parameters in throwing Monte Carlo z distributions of heavy quarks without first correcting for effects such as initial state radiation. 50,000 Monte Carlo events have been generated using the values of $\epsilon_c = 0.05$ and $\epsilon_b = 0.018$, as properly derived by DELCO. These are described in the file F11BET.MCINFO(FILEINFO).

— Next JADE meeting 29/3/84

— S. Wagner 22/3/84

Alman

MINUTES OF THE JADE MEETING
15/3/84

- Agenda
- 1) Current run
 - 2) Shutdown schedule
 - 3) D* production

1) Current run.

Data taking will stop on Monday at 7.00 to allow installation of the mirror for polarisation studies. Measurements will start on the night of Monday/Tuesday and a decision on the feasibility of the study will be taken on Tuesday afternoon. All being well measurements will continue until Thursday morning and data taking will restart on Thursday evening. As our magnet has to be *off* for polarisation studies it is probable that there will be *no shifts* during this period — affected people should check with Beate before turning up for night shifts!

The shutdown starts nominally on April 9. However in view of the state visit on April 6 and the likely celebrations this entails, it is probable that the machine will not be running over the weekend (April 7-8).

It is not yet certain whether the 1 GHz cavities will be removed during the shutdown. Time for the removal has been scheduled, but it could be cancelled up to the last minute. Leaving the cavities in costs $\frac{1}{2}$ mA in currents corresponding to an unspecified loss in luminosity (perhaps 30%??).

2) Shutdown schedule.

Wulf Bartel presented his timetable for the shutdown. The people most involved should already have copies of the schedule — extra copies are available if anyone wants one. All depends on getting the tank out by Easter. We may use the weekend April 7-8 for preparation (shift crew stand by to haul concrete!).

3) Charged D* production.

Lutz Becker described his search for the D*⁺ in the channels $(K^- \pi^+) \pi^+$ and $(K^- 3\pi) \pi^+$, where the bracketed particles are the decay products of a D⁰. A clear signal is seen in both channels and the results obtained are consistent with those reported by other PETRA and PEP experiments.

Next JADE-meeting 22/3/84

S. Cartwright 16/3/84

Olsson

- Agenda:
- 1) Rumours
 - 2) On-line System
 - 3) Physics Results
 - 4) Miscellaneous

1) Conference Report:

Yogi Totsuka gave a brief summary of the new results from the previous week's Moriond conference. MAC presented new lifetime measurements, and new limits on the scalar electron mass. UA1 has a selection of interesting dimuon events.

Erko Pietarinen reported that UA2 claims to see events with W's and jets, with the mass of this system being around 160 GeV. PETRA should reach these energies in a few years during our scan for the elusive top quark, if the cold weather holds.

2) On-line System:

Howard Mills presented a proposal for on-line rejection of T2-accept "bad" events using the Nord-50. This involves a new vertex finding package (written by Peter Steffen) and pattern recognition for events with less than 400 hits in the first two rings of the jet chamber. The program has been extensively tested on- and off-line, and will be implemented this Saturday. The (amazing) result should be a rejection of about 37% of the events we are currently writing to tape, with an insignificant increase of the dead-time

3) Physics Results:

Tadao Nozaki presented an update of his F_2 analysis in two-photon interactions, on which a paper draft is now being circulated. He described the method used for unfolding the structure function, the calculation of the systematic errors due to charmed quark contributions, the effect of radiative corrections, and the extraction of a value for $\Lambda_{\overline{MS}}$ in terms of a particular model (from Dortmund).

4) Miscellaneous:

Wulf Bartel stated that the computer center has about 40 tapes from several years ago with names like F22A##, F22M##, F22T##, and F22U## (# = single digit number) which it would like to get rid of. The (unknown) owners of these tapes should claim them if they want them.

Next JADE Meeting: 15/3/84

S. Wagner, 12/3/84

V. J. J.

Minutes of the JADE Meeting held on 1/3/84

- Agenda:
- 1) Current Run
 - 2) Physics Results
 - 3) Data-Taking Changes

1) Current Run

The energy scan goes on! 46 GeV has been reached and surpassed. When the scan finally comes to an end, there will be about 4 days of running at 2×22.8 GeV to check the energy reproducibility. Also REDUC1 at DESY will then cease so that our 'priority time' at DESY can be used for other purposes. (REDUC1 will then be done at Rutherford).

Rolf Felst reported that JADE results this year at the Leipzig Conference will have to be given in the parallel sessions as there will be no e^+e^- plenary sessions.

2) Physics Results

Sachio Komamiya reported on 2 possible changes to the Vector Meson Paper that he and Jürgen v. Krogh are drafting. The first concerns a prediction for a mass dependence of the vector to pseudoscalar meson production ratio. The second is a possible event sphericity cut used in the η selection.

3) Data-Taking Changes

Howard Mills reported on the JDAS changes that will be necessary to handle the new hardware that is to be installed in April. The z chamber with its DL8 readout is not expected to be a problem. However Howard was pessimistic about the beam pipe chamber readout. He warned that the flash ADC's could swamp JDAS and increase the number of multi-record events that the system has to cope with. Howard suggested that before the upgrade of the inner detector takes place, some thought should be given to a replacement programme for the present on-line computer system.

Austin Ball then presented a proposal to modify the muon filter readout when the energy scan ceases. (This is obviously a very popular topic since non-JADE members had to be restrained from entering the room!) In order to improve the double hit resolution in the muon filter (and hence, improve the punchthrough rejection) it will be necessary to sacrifice the longitudinal readout capability of the muon chambers. This will be a good 'swap' and involves no electrical modifications. In addition the change is reversible.

Next JADE Meeting: 8/3/84 16⁰⁰

Chris Bowdery, 8.3.84

Olson

Minutes of the JADE Meeting held on 21st February 1984

Rolf Felst presented a preview of the talk which he will give to the PETRA workshop on Wed. Feb. 22nd. There was a general discussion of how best to present the case for running at the higher energy.

Minutes of the JADE Meeting held on 23rd February 1984

- Agenda:
- 1) Present Run
 - 2) Miscellaneous
 - 3) Jet Chamber Calibration

1) Present Run:

Hanns Krehbiel mentioned a problem with high deadtimes and BP and TOF currents over the past few days which seems to be fill dependent. The problem with the beam scraping something and spraying the +Z side of the tagging counters was also mentioned. These problems are due to beam steering, and possibly related, so PKR should be notified when they occur. New tagging system scalars have been added (located with the trigger scalars), and these and the lumi histograms should be monitored to check the symmetry between the +Z and -Z counters.

Rolf Felst stated that the safety people have mentioned that some of the smoke detectors in the JADE hall have not been operational since the last thunderstorm, so the shift should be aware that a fire might not trigger the alarms.

2) Miscellaneous:

Peter Steffen announced that he was leaving next week to begin his one year stay at CERN. Comments on the draft of the B lifetime paper can be sent to him at CERN or given to Wulf Bartel.

3) Jet Chamber Calibration:

Joseph Spitzer gave a detailed talk about his recent work on improving the time slewing correction and the single hit resolution in the jet chamber.

Next JADE Meeting: 1/3/84

S. Wagner, 6.3.1984

Olsson

Minutes of the JADE meeting held on 16.2.1984

- Agenda:
1. Present Run
 2. JDAS Changes
 3. Studies of Future Energy Options
 4. Miscellaneous

1. Present Run

Although the latest R compilation (all 4 expts.) still shows no structure, PETRA continues to confound the pessimists and looks set to deliver luminosity at $E_{c.m.} = 46$ GeV!

When a limit is finally reached, there are good prospects of accumulating a quantity of data at an unexpectedly high fixed energy providing winter temperatures prevail to assist the PETRA cooling system. Re-scanning around $E_{c.m.} = 44$ GeV will therefore be left until later. For once, the Hamburg climate may be on our side!

2. JDAS Changes

Howard Mills reported a quantum leap in the history of the online event display. The updating of scenes from the past (a tagging system ≥ 2 generations out of date), has been accompanied by the installation of those from the future (z-chamber). A new indicator of $z = \pm 300$ mm should not be misidentified as a mysterious inner detector fault!

Work towards further online rejection is progressing.

3. Studies of Future Energy Options

Various speakers reported on the relative merits of accumulating large data samples at 37 GeV or 44 GeV (accounting for predicted luminosities). The topics considered were:

searches for scalar leptons and hadrons	Sakue Yamada
searches for excited electrons	Hiroshi Takeda
searches for z-inos, scalar or heavy neutrinos, tests of composite models	Sachio Komamiya
2'nd order QCD (α_s and 4 jet studies)	Siegfried Bethke
3 jet studies	Alfred Petersen

The verdict was unanimously in favour of the higher energy.

Rolf Felst suggested a rehearsal of his talk to the Feb. 22'nd workshop, to take place next Tuesday afternoon (21'st Feb.).

4. Miscellaneous

The HERA bureaucracy is about to hatch - probably in the JADE UK offices! Despite their general enthusiasm for the HERA project, the present tenants made a plea for reasonable warning, and suitable new premises, if eviction proves inevitable!

20.2.1984, Austin Ball

Next JADE meetings: 21.2.84 & 23.2.84

Minutes of the JADE Meeting held on 2/2/84

- Agenda: 1) Current Run
 2) Physics Results

1) Current Run

Beate Naroska reported that the specific luminosity of PETRA is increasing slowly from day to day which is an encouraging sign. In addition Albrecht Wagner stated that the background in the Jet Chamber is acceptable, thanks to the new synchrotron radiation masks. However Austin Ball said that the background in the outer layer (L5) muon chambers is very bad and several chambers have been switched off.

Beate mentioned that the JDAS Operator's Manual* now contains information about resetting HV supplies, and Howard Mills reported that there are several additions and alterations to other sections of the manual as well. Why not have a look during your next shift?

2) Physics Results

Beate presented the latest results of the muon pair analysis for the Autumn '82 and 1983 periods. 444 events have been found after the standard cuts, giving an asymmetry of:

$$A_{\mu\mu} = -14.6 \pm 4.8\%$$

The data are in good agreement with the expectations of the GWS Theory. Unfortunately no electroweak effect can be seen in the total cross section - it probably never will be at PETRA. However Beate reminded us, "Never say never!" Sean Connery couldn't have said it better.

Next JADE Meeting 9/2/84

Chris Bowdery 8/2/84

* Not yet available at all good bookshops unfortunately.

Minutes of the JADE Meeting held on 26/1/84

- Agenda: 1) Current Run
 2) Physics Results

1) Current Run

A new means of checking the PETRA beam energy has been installed at PKR. This should help alleviate fears about PETRA energy reproducibility. Beate Naroska reported that the beam energy would be 22 GeV for about 24 hours, then the scan would continue at 22.595 GeV. Rolf Felst announced the predicted luminosities per day at 2 energy points and asked the group to consider what energy we want to run at after the April shutdown. There will be a discussion meeting at DESY on the 22nd February where JADE will have to state its plans.

<u>E_b</u>	<u>L</u>
18.5 GeV	700 nb ⁻¹ /day
22.0 GeV	400 nb ⁻¹ /day

The next meeting of the PRC will be March 5th.

2) Physics Results

Jörg Hagemann gave a report on the influence of the Jet Chamber resolution and multiple scattering on a B lifetime measurement. Many slides were shown to illustrate the effects based on Monte Carlo studies using the new Lund 5.2 program (Don't say I did not warn you that Lund 5.1 was soon to be replaced!). At the end Jörg showed that, with the new Beam Pipe Chamber, a significant improvement in vertex resolution will occur.

Peter Steffen then explained the work he has been doing on measuring the B lifetime with the existing apparatus.

The analysis was based on 17000 multi-hadronic events (of which 1601 have an inclusive muon or muons) and 38000 M.C. events supplied by John Baines. He quoted a vertex resolution of 570 μm from studies of pions in the data.

After applying several event and track cuts to preferentially select b events and using the standard muon analysis criteria he obtained a positive lifetime value. (The B lifetime analysis is currently being reviewed by a JADE Working Party so no numbers will be given here.)

Next JADE Meeting 2/2/84, Chris Bowdery, 8.2.84

Minutes of the JADE Meeting held on 19/1/84

- Agenda: 1) Current JADE/PETRA Status
2) Who talked?

1) Current JADE/PETRA Status

Beate Naroska reported that machine development was underway at PETRA and would continue until Wednesday 25/1/84. On that day there will be a 12 hour access period and maybe a few more hours on the following day. It is hoped that data-taking may be possible from Friday 27/1/84 onwards.

Rolf Felst said that energy-setting reproducibility may be tested first by depolarisation measurements and then the unfinished energy scan will be continued. Ian Olsson stated that the DL8's should all be operational in time for data-taking following modifications made to the connectors.

2) Who talked?

No, not another leak of secret information to MARK-J but a request from Rolf Felst to help him compile a list of talks given by JADE members for the DESY annual report. If you gave a seminar or conference report in 1983, could you please let Rolf know immediately please.

Next JADE Meeting 26/1/84 (will include B lifetime report)

Chris Bowdery 24/1/84

Olson

Minutes of the JADE Meeting held on 12/1/84

- Agenda: 1) R Compilation
2) Proposed Very Small Angle Tagging System
3) Results

1) R Compilation

Makoto Minowa gave a brief report on the compilation of the R values of CELLO, MARK-J, TASSO and JADE.

No peaks are seen in the combined plot of the autumn energy scan except possibly around 44 GeV. These points are probably nothing but a fluctuation but may well need to be remeasured this year.

2) Proposed Very Small Angle Tagging System

Rolf Felst introduced Chung Chang as a new member of JADE from Maryland. Chung then outlined a proposal to add a new very small angle tagging system to complement the existing tagging detector. This would involve removing our existing synchrotron radiation absorbers (so soon?) and installing a new beam pipe with a constriction housing an array of BGO crystals possibly read out with photodiodes. This would allow tagging off scattered electrons down to 12 m rad. This would improve the single (double) tag efficiency by a factor of 2.1 (4.3).

The total cost has been estimated at \$ 208 K. This demonstrates that even tiny taggers cost big bucks!

3) Results

Tadao Nozaki reported on his work on comparing the photon structure function F_2 with a new QCD calculation. Theorists have now included a 'hadronic contribution' that had been previously neglected. Sadly the end result is a loss of sensitivity to the QCD Λ parameter. This is a great disappointment, particularly after all the work Tadao has done on this topic. (Maybe the next 'improvement' by the theorists will restore the sensitivity?)

Next JADE Meeting 19/1/84

Chris Bowdery 19/1/84

Olsson

Minutes of the JADE Meeting held on 5/1/84

- Agenda:
- 1) Conferences 84
 - 2) Current Shutdown
 - 3) Physics Results

1) Conferences 84

Rolf Felst opened the meeting by wishing everyone a happy New Year. He then enquired whether anyone was interested in attending a conference on instrumentation in HEP at Novosibirsk, 15th - 21st March this year. A trip to Siberia in late winter should not be missed! Another important annual conference is the Deutsche Physikalische Gesellschaft meeting which this year will be held in Bielefeld between the 2nd and the 4th April. The conference language will be English as it is a combined meeting with other European physical societies. The deadline for including abstracts in the conference handbook has passed but contributions can still be prepared up till the last moment, as always.

2) Current Shutdown

Wulfrin Bartel reported that the synchrotron radiation masks have been inserted into the beam pipe and that the mini- β quadrupoles were going to be surveyed. He also announced that the muon arches were going to be opened despite the earlier statement to the contrary. Thus they will be opened on Monday 9th January and closed in the afternoon the following day. This will allow the checking of the PM tubes of the TOF counters and the End Cap LG.

3) Physics Results

Karlheinz Meier took the floor to report on recent work he has done on inclusive π^0 's and γ 's. He started off by listing those aspects of JADE's photon detector that are superior to other experiments. Needless to say it was a long list!

- better energy resolution
- better γ (and hence π^0) detection efficiency
- lower energy threshold (π^0 : $p > 200$ MeV)

This means we have more data than other groups. He also admitted that we have problems separating close γ 's because of the LG granularity which shows up in plots of high momentum π^0 's.

The two results he showed demonstrated the agreement between the production cross sections of our π^0 's and TASSO's π^\pm 's and verified that the π^0 cross section

'scales' as expected.

Michael Kuhlen then continued with a similar theme: studies of inclusive converted photons. Using MH events with 2 or more converted γ 's, he was able to plot a $\gamma\gamma$ mass spectrum and observe a clear π^0 peak ($m = 131 \pm 4$ MeV, $\sigma = 29 \pm 4$ MeV).

This study uses mainly low energy converted photons. Michael also plotted a single converted γ energy spectrum and showed evidence for photon production not emanating from π^0 and η decay. This could be due to initial state radiation, D^* decay, F^* decay and similar processes.

Next JADE Meeting 12/1/84

Chris Bowdery 12/1/84

(Belated) Minutes of the JADE meeting held on 15/12/83

Agenda: Present run and PETRA schedule
Results
Online rejection

Present run

Our request for extension of the shutdown until 11/1/84, to allow installation of additional synchrotron radiation masks, has been approved.

There is some controversy over the reproducibility of the energy setting.

At present this is measured by one device only, but further instrumentation will be installed.

Results

Sachio Komamino presented his work in searching for, and setting limits on, the production of Z-ino particles.

Online rejection

Howard Mills reviewed the status of online event rejection in the NORD-50.

At present, the programs reject cosmic rays which contaminate the "J.O." trigger, or graze the leadglass barrel. These algorithms appear to work well, and it was agreed that a new one, designed to reduce spurious triggers from noisy leadglass counters, should be implemented immediately.

Olsson

Agenda: 1) The Current Run

- 2) Synchrotron Radiation in the Jet Chamber
- 3) The LUND 5.1 Monte Carlo Program
- 4) Results

1) The Current Run

Rolf Felst reported that no bumps have yet been observed in the combined R plot of all the experiments. Next year there may be an increase in the currents in PETRA to increase the luminosity.

2) Synchrotron Radiation in the Jet Chamber

Albrecht Wagner reported on the problem of high currents in the Jet Chamber with the present beam currents in PETRA. The cause is the large number of synchrotron radiation hits in the chamber. These give rise to several unwanted effects: E-field changes in the drift cells due to space charges and voltage drops in the drift resistor chain, random hits and a reduced chamber lifetime. He suggested 3 alternatives for dealing with the problem.

- a) Run at a lower energy eg 21 GeV, or
- b) Run with a reduced gas amplification by a factor of 2 (This will worsen the z resolution but improve dE/dx), or
- c) Reduce the incidence of synchrotron radiation in the chamber.

Wulfrin Bartel then described his studies of the synchrotron radiation problem and outlined a solution along the lines of option (c) above. JADE already has a S.R. mask placed in front of the QA quadrupole at each end of the experiment. This has an elliptical hole corresponding to the beam profile at that point, i.e. larger vertically than horizontally. A second S.R. mask is also needed, it appears, closer to the experiment. This will be also elliptical but with the largest axis horizontal. (It was agreed on 12/12/83 to implement this idea, working from the beam pipe flange near the mini β quadrupoles. The work will be carried out during the Christmas mini-shutdown. The experiment will not be opened.)

3) The LUND 5.1 Monte Carlo Program

Siegfried Bethke reported on work done by him, Alfred Petersen, Peter Warming and Sachio Komamiya to make the new Lund Monte Carlo program available to JADE. Version 5.1 has full 2nd order OCD built in as well as a new

fragmentation function. The latter uses the formula:

$$f(z) = (1-z)^a \frac{1}{z} e^{-bm_f^2} \quad m_f^2 = m^2 + p_f^2$$

where a and b have been determined from comparisons with real data. (a = 1, b = 0.75). This describes u,d,s and c very well but gives the b quark too hard a fragmentation, $\langle z \rangle_b = 0.91$. $\alpha_s = 0.16$ describes our data well so this is the recommended value to use. The rapidity, thrust and sphericity plots have improved compared with version 4.3 of the Monte Carlo. However the Q1 plot is no better but this may be due to the b quark fragmentation being too hard. (N.B. Watch out for the imminent release of LUND 5.2).

4) Results

Dieter Haidt showed an event with a D^* found in one jet, a candidate prompt muon in a second jet and a clear third jet. He offered this as evidence for a $c\bar{c}g$ event.

(On 12/12/83, at an extraordinary JADE meeting, Steve Wagner reported on his work on the radiative decays of heavy mesons. He presented encouraging signs of D^{0*} decays and a possible F^* decay signal. This work is continuing.)

Next JADE meeting 15/12/83

C. Bowdery, 19/12/83

Late News

The Return-of-the-Jadites, unselfish as ever, gallantly allowed the Mischlings to win the last football match 4-3. Hugh McCann and Rolf Heuer have been transferred to other 'teams' and so we wish them all the best for the future.