τ Physics at the CESR B Factory*

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I was originally asked to speak on the prospects of doing τ physics at future B factories, i.e., machines to be designed and built in the upcoming decade(s) to achieve 10^{34} luminosities at $\Upsilon(4S)$ energies. I have decided that I could give a more meaningful talk if the subject were the future of τ physics at the world's existing B factory, namely CESR at Cornell. While I feel that much can and will be done by CLEOII with τ's at CESR, I do not intend this presentation to be one of hype and unwarranted optimism, but rather an honest look at some of the topics being discussed at this workshop.

I will not speak at all on the subject of final states involving π^0's since Tomasz Skwarnicki (Syracuse) will be addressing that issue separately. Similarly, I will only briefly review the prospects for measuring the τ lifetime since Richard Kass (Ohio State) will be going into that in detail.

The following page lists the topics I will be discussing.

* Talk presented at Tau/Charm Workshop, SLAC, May 1989.

Topics to be addressed:

1) How many τ's are we going to produce?
   - CESR luminosity improvements
   - CESR/CLEOII run plans

2) Triggering and data acquisition considerations for τ's
   - proposed CLEOII triggers
   - filters, etc.

3) Efficiency considerations for τ's

4) Backgrounds for τ's at $\sqrt{s}$ = 10.55 GeV

5) Measurements of some fundamental τ properties
   - lifetime
   - Michel parameter, ρ
   - other measures of Lorentz structure
   - mass of the tau neutrino

6) Some specific τ decay channels
   - B_K/B_π and B_{K*}/B_ρ
   - $B(\tau \to \omega\pi\nu)$
   - purely leptonic decays

7) Collection of unbiased τ samples using lifetimes

8) Other τ analyses

9) Other problems in doing τ physics with CLEOII/CESR

1) How many τ's?

The point cross section for $e^+e^- \rightarrow \tau^+\tau^-$ at $\Upsilon(4S)$ energies is σ_{pt} = 0.77 nb; corrections raise this by 19% to σ_{cr} = 0.92 nb. Thus the τ pair cross section is roughly the same size as that of $\Upsilon(4S)$ itself.

As indicated in Figure 1, the total integrated luminosity for CLEO at the $\Upsilon(4S)$ is roughly $0.6f^{-1}$. At present we are in a shutdown period finishing the installation of CLEOII hardware, improving machine vacuum, etc.. After a run at the $\Upsilon(3S)$ which will collect some 350 pb^{-1}, CESR will begin running in earnest at the $\Upsilon(4S)$ again early in 1990. Figure 2 shows the recent CESR history of luminosity, plotted as pb^{-1} per interaction region per week over a three year period. Few doubt we will soon be once again running at 4-5 pb^{-1} per day. Late in 1990 the CUSB experimental program in the CESR north interaction area will terminate (see Figure 3) and CESR will be converted to a lattice with a single interaction area. A conservative prediction is that the luminosity will then increase to on the order of 2 fb^{-1} per year, as indicated by the slope of the line in Figure 1 for the years 1991 and 1992.

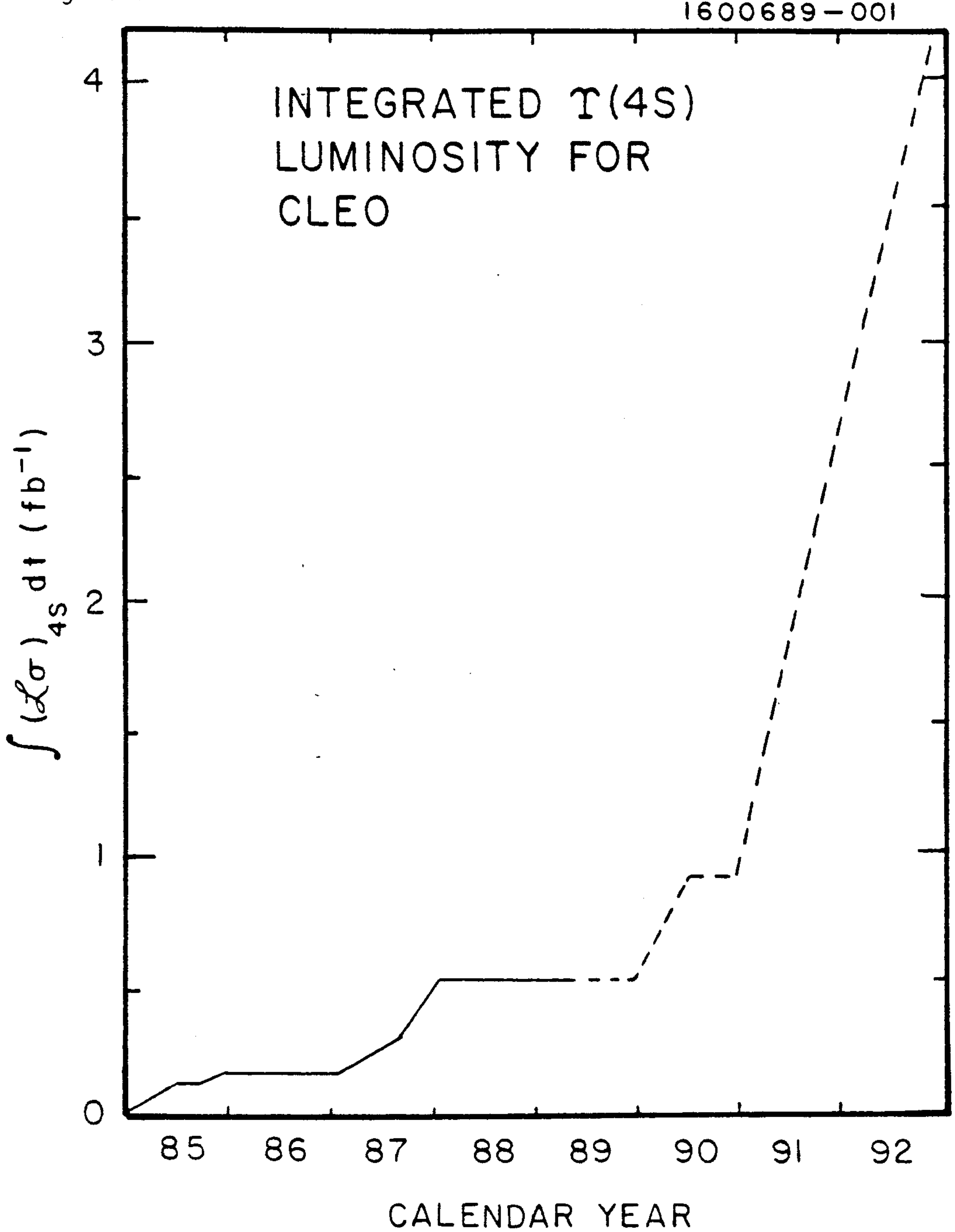
Of course, running at the $\Upsilon(3S)$ still produces τ pairs. In fact, this is a slight advantage of high energy machines over τ-charm factories: <u>all</u> running has equal ability to produce τ results.

By the end of 1992, CLEO should then have accumulated a total data sample in excess of 4.0 fb^{-1}; some 3.5 fb^{-1} of will be with the new detector. The total number of tau pairs produced for study with CLEOII will therefore be

$$N_{\tau\tau} = \int L\sigma dt = 3.2\cdot 10^6 .$$

To be very conservative, I will use $2\cdot 10^6$ in the following examples; this number could easily be low by 50% and it only represents data collected before the end of 1992. CESR and CLEOII could well run far beyond that, perhaps doubling again the available τ sample before the advent of a τ-charm factory (or other B factory).

Figure 1



1600689-001
INTEGRATED Υ(4S)
LUMINOSITY FOR
CLEO
4
3
2
1
0
∫(ℒσ)4S dt (fb⁻¹)
85
86
87
88
89
90
91
92
CALENDAR YEAR

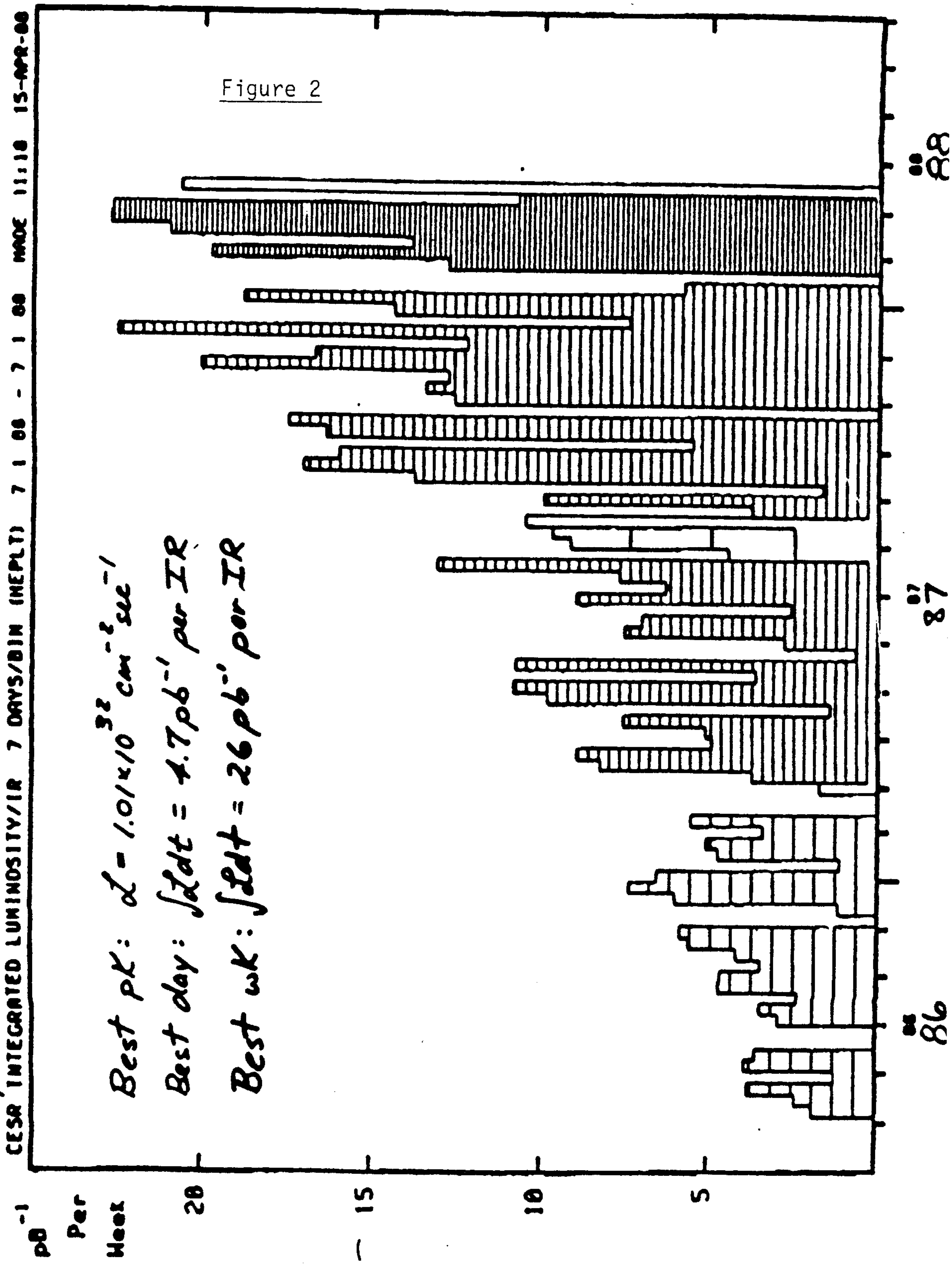
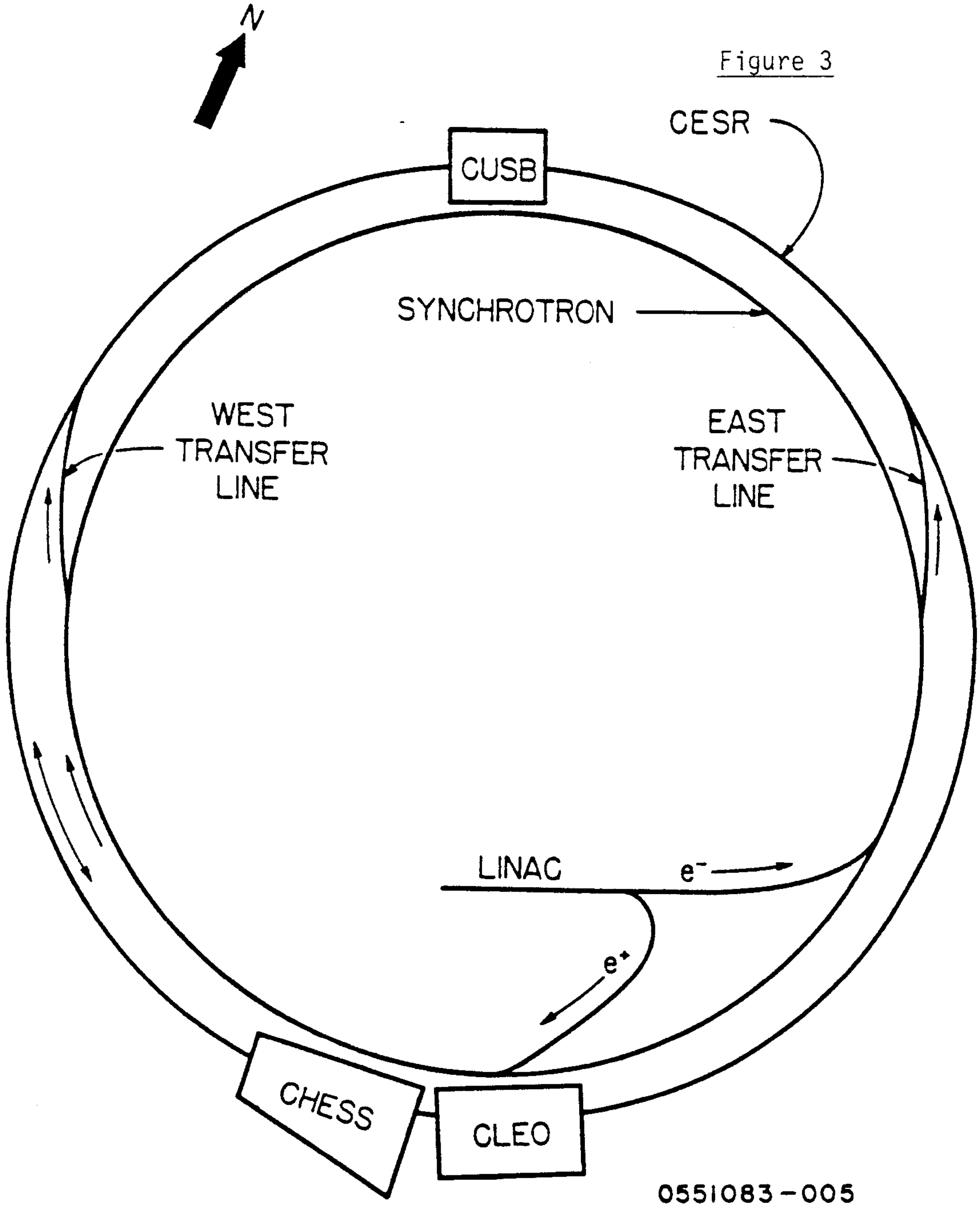

CESR INTEGRATED LUMINOSITY/IR 7 DAYS/BIN (MEPLT) 7 1 86 - 7 1 88 MADE 11:18 15-APR-88
pB-1 Per Week
20
15
10
5
86
87
88
Best pk: 𝓛 = 1.01×10^32 cm^-2 sec^-1
Best day: ∫𝓛dt = 4.7 pb^-1 per IR
Best wk: ∫𝓛dt = 26 pb^-1 per IR

Figure 2

Figure 3


N
CESR
CUSB
SYNCHROTRON
WEST
TRANSFER
LINE
EAST
TRANSFER
LINE
LINAC
e⁻
e⁺
CHESS
CLEO
0551083-005

This conservative estimate of 2 million produced tau pairs breaks down into the following interesting subsets.

$$N_{13} = 2\, N_{\tau\tau}\, B_1\, B_3 = 450\,000$$

$$N_{\ell 3} = 2\, N_{\tau\tau}\, (B_e + B_\mu)\, B_3 = 200\,000$$

$$N_{e\mu} = 2\, N_{\tau\tau}\, B_e\, B_\mu = 125\,000$$

$$N_{15} = 2\, N_{\tau\tau}\, B_1\, B_5 = 4\,000$$

$$N_{\ell 5} = 2\, N_{\tau\tau}\, (B_e + B_\mu)\, B_5 = 2\,500.$$

These are the numbers actually produced. The detected data samples will depend on efficiencies, cuts, etc., which I'll discuss below.

2) Triggering Concerns

The trigger lines in CLEOI which gave us $\tau\tau$ events were:

a) >2 charged tracks

b) >1 charged track with a back-to-back pair

c) >1 charged track with a photon ($E_\gamma > 1$ GeV)

d) >1 charged track with one of them an electron ($E_e > 1$ GeV)

While these trigger combinations have proven adequate in the past, they clearly have limitations. For example, we have very low efficiency for $\tau^+\tau^-$ final states of the form $(\pi^+\bar{\nu})(\pi^-\nu)$, which has only two charged tracks that aren't colinear. There is also the concern that 1-vs-3 events such as that shown in Figure 4 will have the three charged tracks interpreted as only one track, due to the small opening angle. Such a misinterpretation might give a bias against three pronged final states with low invariant mass. I should point out that we have not observed any such bias; on the other hand we have not been compelled to look for such effects at levels below a few per cent.

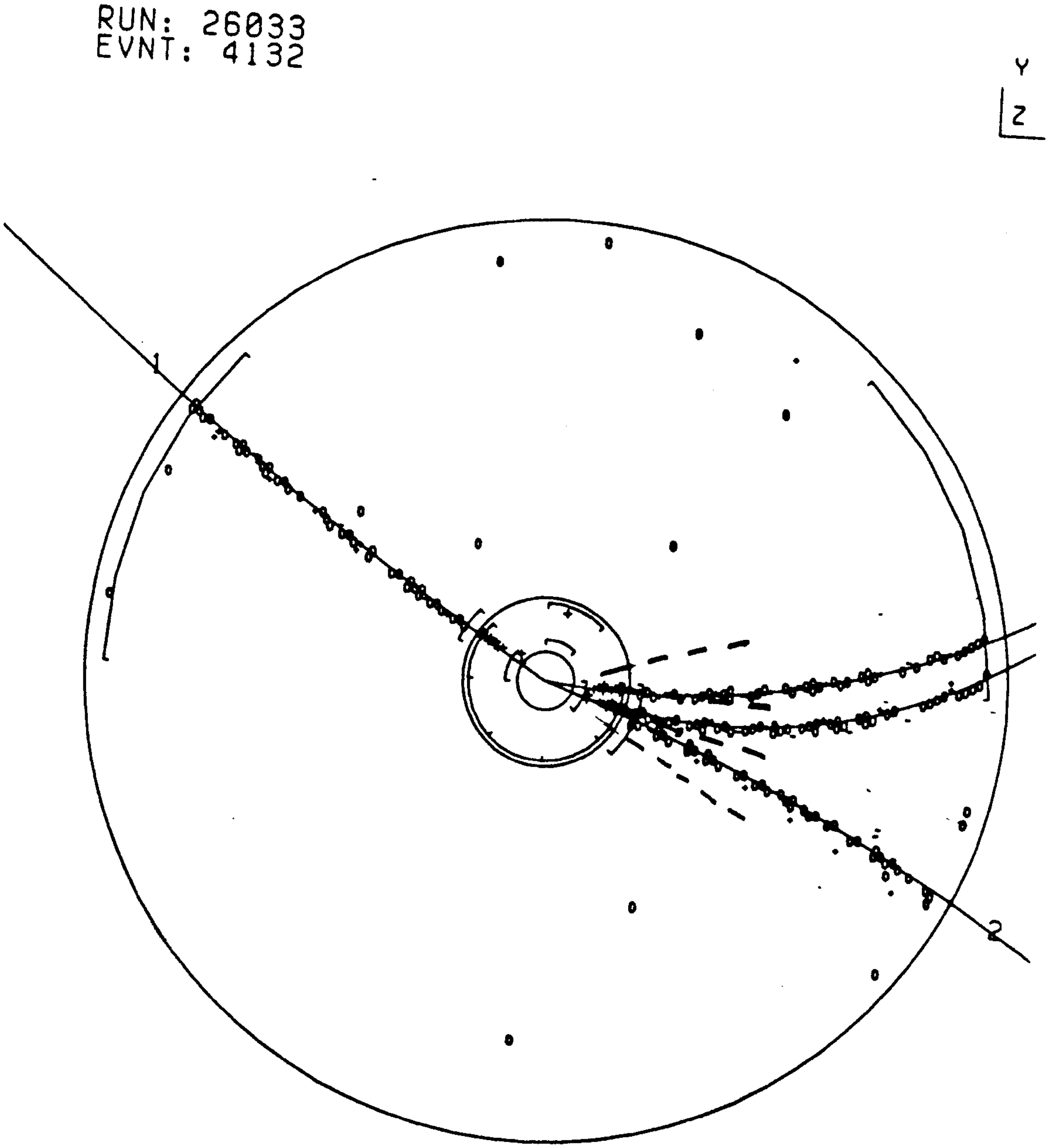


Figure 4

The goal of CLEOII is to have a generic two track trigger. One of the problems with such a loose trigger in the past has been high background trigger rates from cosmic rays and beam gas events. Use of a new trigger element in the 10 layer vertex chamber will be crucial in our ability to finally realize this sort of trigger for CLEO.

Holding to such a loose, minimally-biased trigger may not be easy when the luminosity starts to grow in the upcoming years. Although we are also upgrading our data acquisition system, the overall trigger rate may get too high, incurring a large dead time. Being a B factory, the decision between $\pi\pi$ final states from τ's and higher live fraction is obvious.

Of course, taking $\tau\tau$ triggers and getting the events to tape are two different matters. Online filters help weed out "junk"; if you're doing B physics, you might indeed classify low multiplicity $\tau\tau$ events in this way! Those interested in doing τ physics at B machines need to have enough forethought to generate adequate filters with proper cuts so that their analyses are not killed off from the very beginning.

While discussing triggers in CLEOII, I should point out some other highlights and improvements over CLEOI:

- CsI crystals as a trigger element will be more efficient with lower threshold than CLEOI's shower counters;
- the time-of-flight scintillators now cover almost all of 4π;
- the tracking chamber trigger will now correlate tracks from the various tracking devices instead of simply counting them;

Never being satisfied, we are also actively investigating the following possible future trigger upgrades:

- a cathode trigger to determine the z co-ordinate of the vertex (useful for eliminating beam-wall, beam-gas, and cosmic backgrounds);
- a trigger input form the outer muon chambers to complement the electron triggering capability of the CsI;

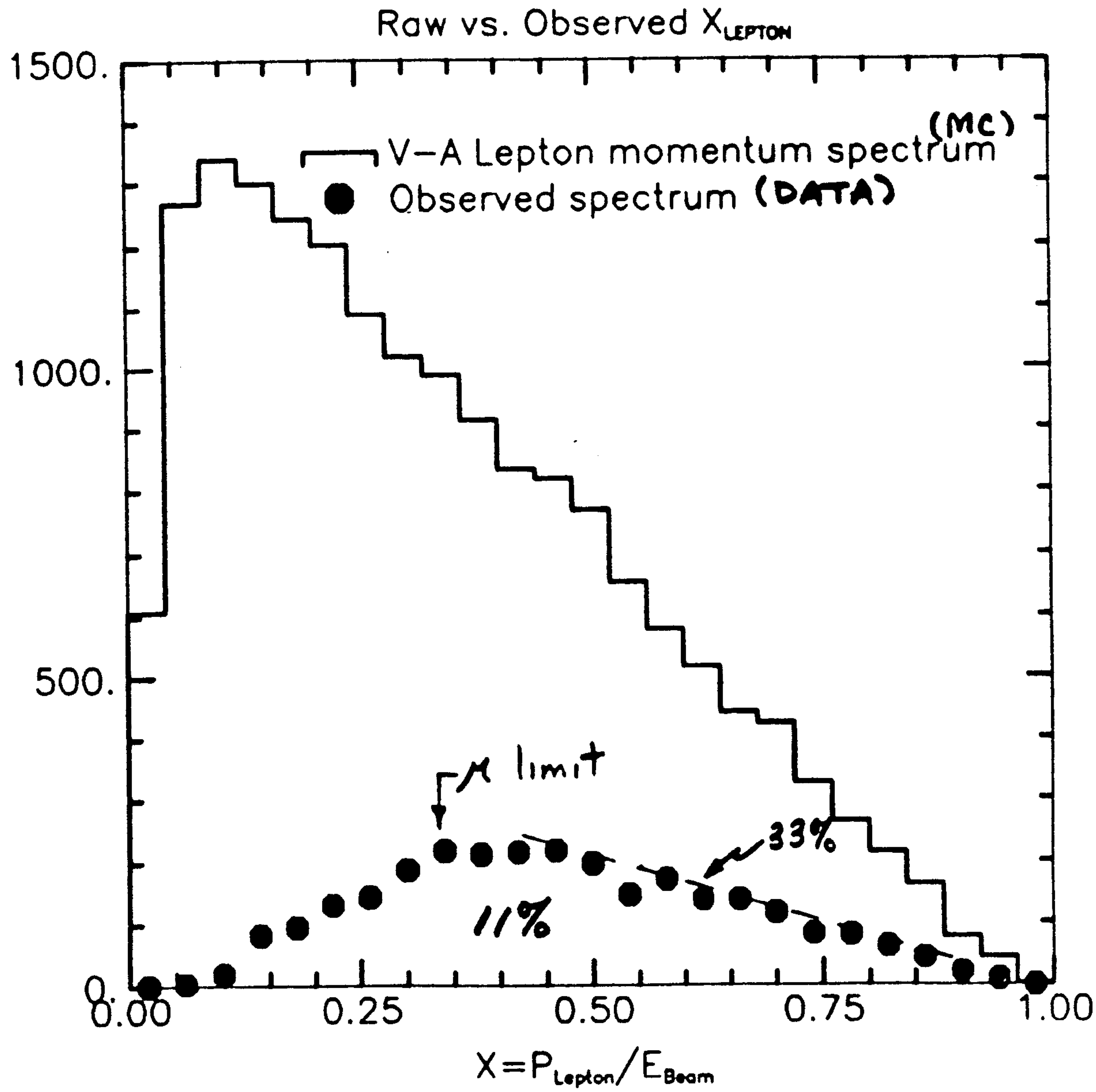
- use of the new 6 layer straw tube insert in the tracking trigger.

3) Efficiencies

The τ analyses in CLEOI have also suffered from poor γ and π^0 detection. This has meant that our cuts have always been based on charged energy as opposed to total energy. Our overall efficiency for finding a generic 1-vs-3 event which passed all our cuts in CLEOI was roughly 40%.

Given the huge data sample forthcoming, our goal for CLEOII is not so much to improve on this 1-vs-3 efficiency as it is to reduce the backgrounds (see next section). For example, a major contributor to the inefficiency is the finding of all four tracks, which is not likely to improve dramatically in CLEOII since we have the same drift chamber as in the recent CLEOI running. The excellent capabilities and coverage of the CsI calorimeter, the greater acceptance of the time-of-flight scintillators, and the improved track separation at small radius will all help in these efforts.

The fraction of ℓ-vs-3 events which passed the cuts in CLEOI is significantly lower than 40%, as shown in Figure 5. The histogram is the V-A spectrum as generated by Monte Carlo for the same integrated luminosity as the data sample whose spectrum is shown in the solid octagons. The ratio of the areas is only 11%. Even at high momentum the ℓ-vs-3 events have slightly lower than 40% efficiency since the muon and electron identification are not totally efficient and because electrons had to have a more restrictive polar angle than other single tracks in order to be inside the calorimeter fiducial volume. There was no muon efficiency below $p_\mu = 1.6$ GeV/c and the electron efficiency began to fall below $E_e = 1.2$ GeV.



Raw vs. Observed X_{LEPTON}
1500.
1000.
500.
0.
(MC)
V-A Lepton momentum spectrum
Observed spectrum (DATA)
μ limit
33%
11%
0.00
0.25
0.50
0.75
1.00
$X=P_{Lepton}/E_{Beam}$

Figure 5

These ℓ-vs-3 events should receive some boost in efficiency in CLEOII. The CsI calorimeter should do much better at e-π separation in the lower energy region and both the electron and muon identification have increased solid angle coverage. However, the cut-off in muon momentum in likely to be the same, if not slightly worse.

4) Backgrounds at $\sqrt{s}$ = 10.55 GeV

Here I will consider four sources of "physics" background. However, let me remind those contemplating the building of a new machine of any sort (B factory, τcF, etc.) that beam-wall and beam-gas backgrounds are exceptionally important! A great deal of attention must be paid to masking, shielding, and vacuum.

$B\bar{B}$ events: these events have a large multiplicity ($\langle n_{ch}\rangle \sim 12$) and are rather spherical in nature. A Monte Carlo study has indicated feedthroughs of these events is less than 10^{-3}. Since the cross section for $B\bar{B}$ is the same at that for $\tau\tau$, this is not a serious background.

$ee\gamma$ events: here one of the electrons will tend to have the beam energy, both electrons should shower, and the photon should either be detectable or should convert into an e^+e^- pair whose invariant mass is zero. CLEOI did a reasonable job on all of these fronts; CLEOII will be better.

$\gamma\gamma$ events: by this I mean untagged two-photon processes. These events produce low-mass objects, have large missing p_z and E, and have small p_{per}, etc.. Part of the reason CLEOI had to make such stiff cuts against this class of background is that we have only one person doing two-photon physics! Hence our Monte Carlo abilities and our understanding of typical topologies, effective cuts, etc. have been lacking. We presently do a credible job removing this background but more effort needs to be put on this in the future. The improved neutral detection of CLEOII will certainly help.

$q\bar{q}$ events: this is our main source of background. The mean multiplicity is lower ($\langle n_{ch} \rangle \sim 9$) than for $B\bar{B}$ events and the event topology tends to be more jet-like (as it is for $\tau\tau$). We feel that it is for this background that the improved π^0 and γ efficiencies of CLEOII will be most helpful.

What sort of background levels are experienced at $\Upsilon(4S)$ energies from these sources? ARGUS (as indicated in their 1987 analysis of the $\pi\omega\nu$ final state[1]) has roughly a 2% background from $q\bar{q}$ and 4% from $\gamma\gamma$. CLEO[2] has had backgrounds in its 1-vs-3 samples on the order of 16%, with almost all of it[3] coming from $q\bar{q}$. Monte Carlo studies indicate that 74% of this $q\bar{q}$ background is from light quarks ($u\bar{u}$, $d\bar{d}$), 11% from strange quarks, and 15% from charmed quarks.

When CLEOI restricted itself to ℓ-vs-3 events, the background fraction was lowered[2] to roughly 4%. Now this contamination is mostly from $c\bar{c}$, with missing K_L^0's being a major contributor. CLEOI found backgrounds in 1-vs-5 events to be too large to attempt any meaningful analyses, although ARGUS, with its superior photon detection inside the solenoid, has dome some nice work in that area.[4]

CLEOII certainly hopes to be able to reduce these backgrounds, hopefully to the 5% level in 1-vs-3 events, to the 2-3% level in ℓ-vs-3 events, and to a tolerable level in 1-vs-5 events.

It is clear that the tau-charm factory will have a big advantage in this area of backgrounds. The ability to run below $c\bar{c}$ threshold and also below $\tau\tau$ threshold is very important.

5) Measure of Fundamental τ Properties

a) Tau Lifetime, τ_τ

As I mentioned above, a separate talk will be given to this working group by Richard Kass on the prospects of measuring the τ lifetime at CLEOII and elsewhere.

The previous CLEO measurement[2] was based on only 133 pb^{-1} of data and gave τ_τ = (0.327 ± 0.014 ± 0.016) psec from 7200 1-vs-3 events and (0.308 ± 0.028 ± 0.011) psec from 2000 ℓ-vs-3 events. Figure 6 shows the results of that analysis using two techniques: a) measuring the displacement from average beam center of the 3-prong vertex; b) using the impact parameters of the 3 prong side.

By contrast, the present world average has an overall uncertainty of roughly 3%. With CLEOII we will have more than 16 times the data sample (reducing the statistical error and allowing a better understanding of some of the systematics), better signal to noise (reducing the systematic uncertainty in the 1-vs-3 in particular), and better vertex resolution (perhaps X2 improvement). My own estimate (which may be different from Kass' assessment) is that CLEOII will eventually have results such as (0.3xx ± 0.003 ± 0.008) psec from the 1-vs-3 channel and (0.3yy ± 0.006 ± 0.006) psec from the ℓ-vs-3 sample. It is also conceivable that we may have a result from e-vs-μ events, but this is likely to be less precise.

As a quick aside, it is possible that by 1992 the LEP experiments will have also measured τ_τ to the 3% level.

b) The Michel Parameter, ρ

Given the talks to this working group by Tsai and Fetscher, I'm a little remiss to push on the Michel parameter ρ, since it may not be the most interesting of quantities. Nonetheless, it is important to

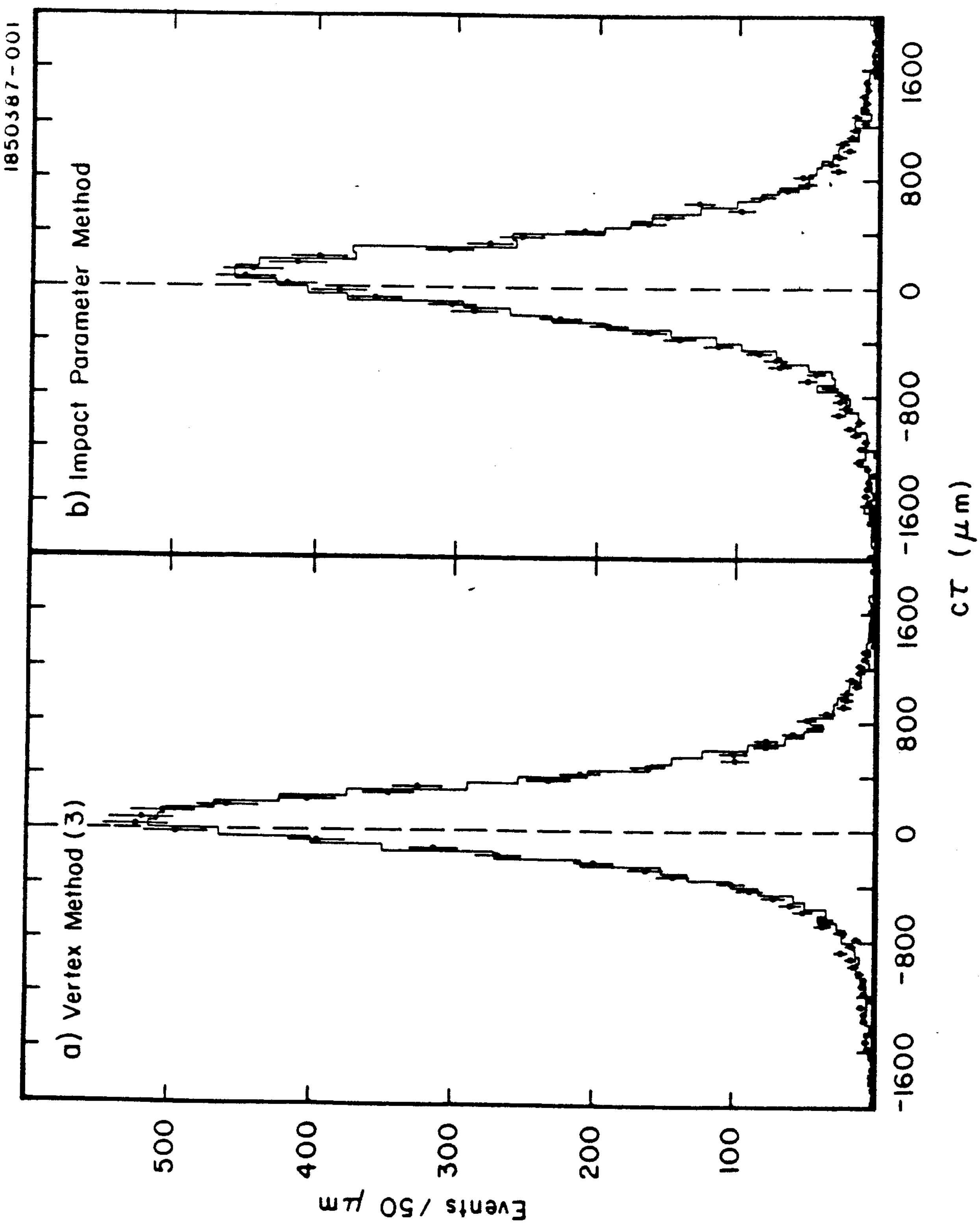

1850387-001
a) Vertex Method (3)
b) Impact Parameter Method
Events / 50 μm
500
400
300
200
100
cτ (μm)
-1600
-800
0
800
1600

Figure 6

establish that its value in τ decay **really** is 0.75. Many groups have measured this parameter[5-8] in addition to CLEO[9], always obtaining consistency with $\rho = 0.75$. However, the errors are still on the order of **10%** and there is the tantalizing fact that ρ as determined from the decay $\tau \to e\nu\bar{\nu}$ is some 2σ lower than that from $\tau \to \mu\nu\bar{\nu}$.

The data from CLEO are shown in Figure 7, with the solid curve being V-A ($\rho = 0.75$) and the dashed curve representing V+A ($\rho = 0.00$). The data sample used was only 130 pb^{-1}, which gave us some 700 e-vs-3 and 700 μ-vs-3 events. By 1992, we will not only have more than 16 times this much data in these channels, but should also be able to use the large number of e-vs-μ events we will collect. These should allow us to determine $\rho = (0.7x \pm 0.02 \pm 0.02)$.

c) <u>Other Measures of the Lorentz Structure</u>

There are other parameters which must also be measured to assure that the τ weak current is purely V-A with no scalar, pseudoscalar, or tensor components. A nice summary of these was given by Wolf Fetscher is his talk to this working group.

As an example, consider the energy-energy correlations of the two pions in the final state $(\pi^-\nu)(\pi^+\bar{\nu})$. That the energies should be correlated can be seen from Figure 8. The virtual photon produces τ's whose helicities are correlated; on any one event the τ^+ can have **either** helicity +1 (as in the figure) or -1, but the τ^- will have the **opposite** helicity. Given that the pions are spinless and that the neutrino is always left-handed, the pions will tend to either both be produced backwards in the centers-of-mass (as in the figure) or forwards. Using θ as the angle in the τ rest frame and m as the τ mass, Kuhn and Wagner[10] give the differential cross section as:

Figure 7

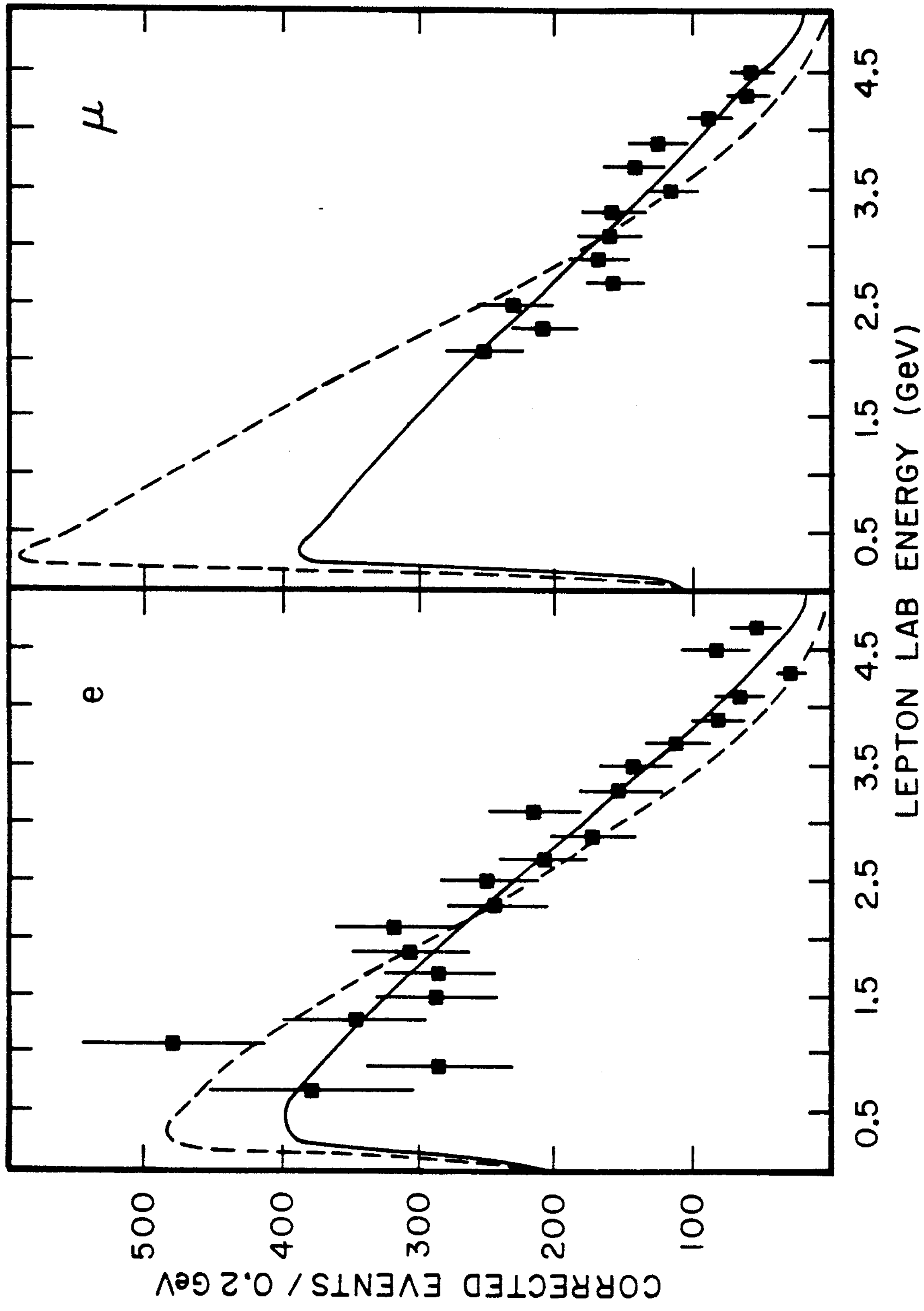
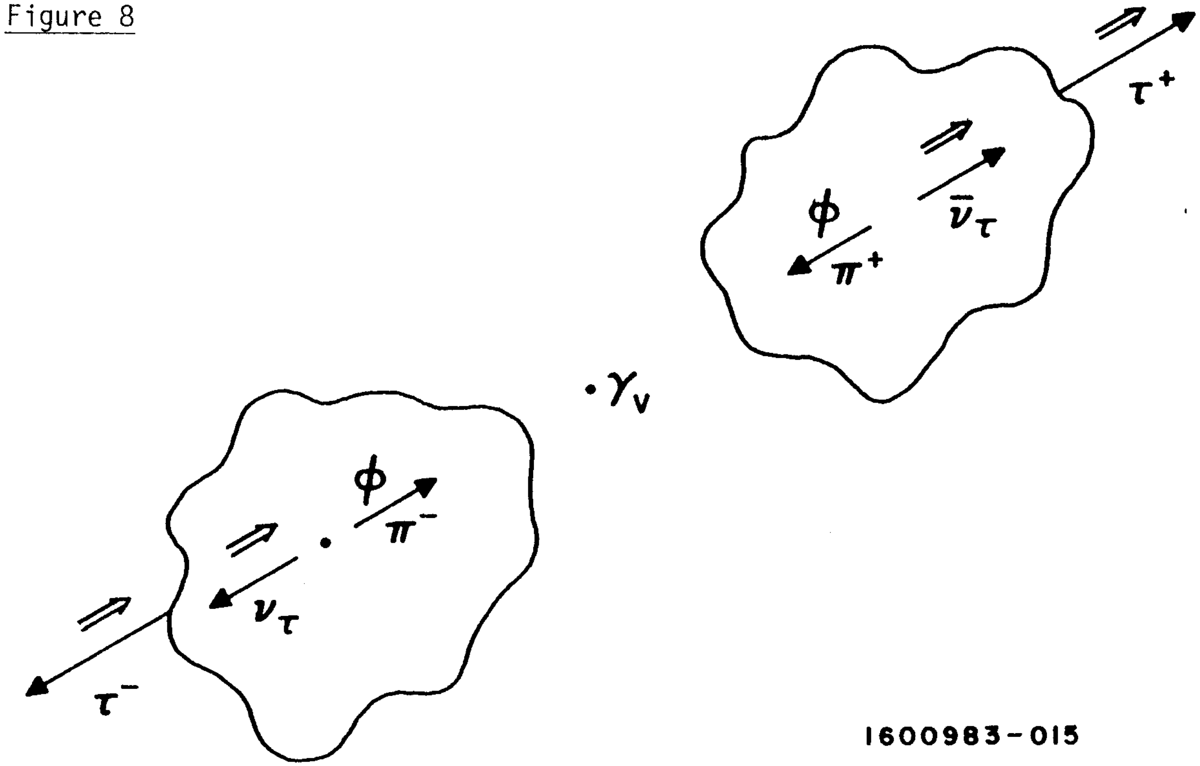

1600785-004
μ
e
0.5
1.5
2.5
3.5
4.5
LEPTON LAB ENERGY (GeV)
100
200
300
400
500
CORRECTED EVENTS / 0.2 GeV

Figure 8



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$$\frac{d^2\sigma}{d\cos\theta_+ d\cos\theta_-} = \frac{2\pi\beta\alpha^2}{6s}\left[1 + \frac{2m^2}{s} + \gamma^2 \frac{(s-2m^2)}{(s+2m^2)}\cos\theta_+ \cos\theta_-\right].$$

In this expression γ^2 is a measure of the Lorentz structure, being 1 for V±A and 0 for pure V or pure A. Similar expressions come from other analyses.[11]

B factories are well suited to measure such correlations. If I rewrite the term in [ ] as $[A + B\,\gamma^2 \cos\theta_+ \cos\theta_-]$, the ratio B/A is an indication of how visible the correlation will be. This is the ratio plotted in Figure 9 (left axis). However to see the effect an experiment also needs statistical power; the $\tau\tau$ cross section is falling with s and the statistical uncertainties is rising as $\sqrt{s}$. The right axis takes this statistical capability into account.

CLEOI's lack of a generic two track trigger made such a study very difficult; furthermore our stiff cuts on charged energy eliminated events in the region of maximal correlation! Hopefully proper triggers and filters (see section 2 above) will make such studies possible with CLEOII.

d) Limit (or measurement!) of ν_τ mass

The best present limit of $m_\nu < 35$ MeV/c^2 comes from the ARGUS[4] study of $(5\pi)\nu$ final states, of which they have 12 events. CLEOII will have some 400 such events (assuming 10% efficiency) and should be able to place limits at the level of 15 MeV/c^2.

The best 1-vs-3 limits[12,13] are on the order of 70 MeV/c^2. Better π^0 identification and measurement will help significantly here and limits of 30 MeV/c^2 should be attainable.

However, limits on the order of 5 MeV/c^2 are likely to be impossible in the near future due to systematic effects such as momentum errors, τ mass uncertainty, etc..

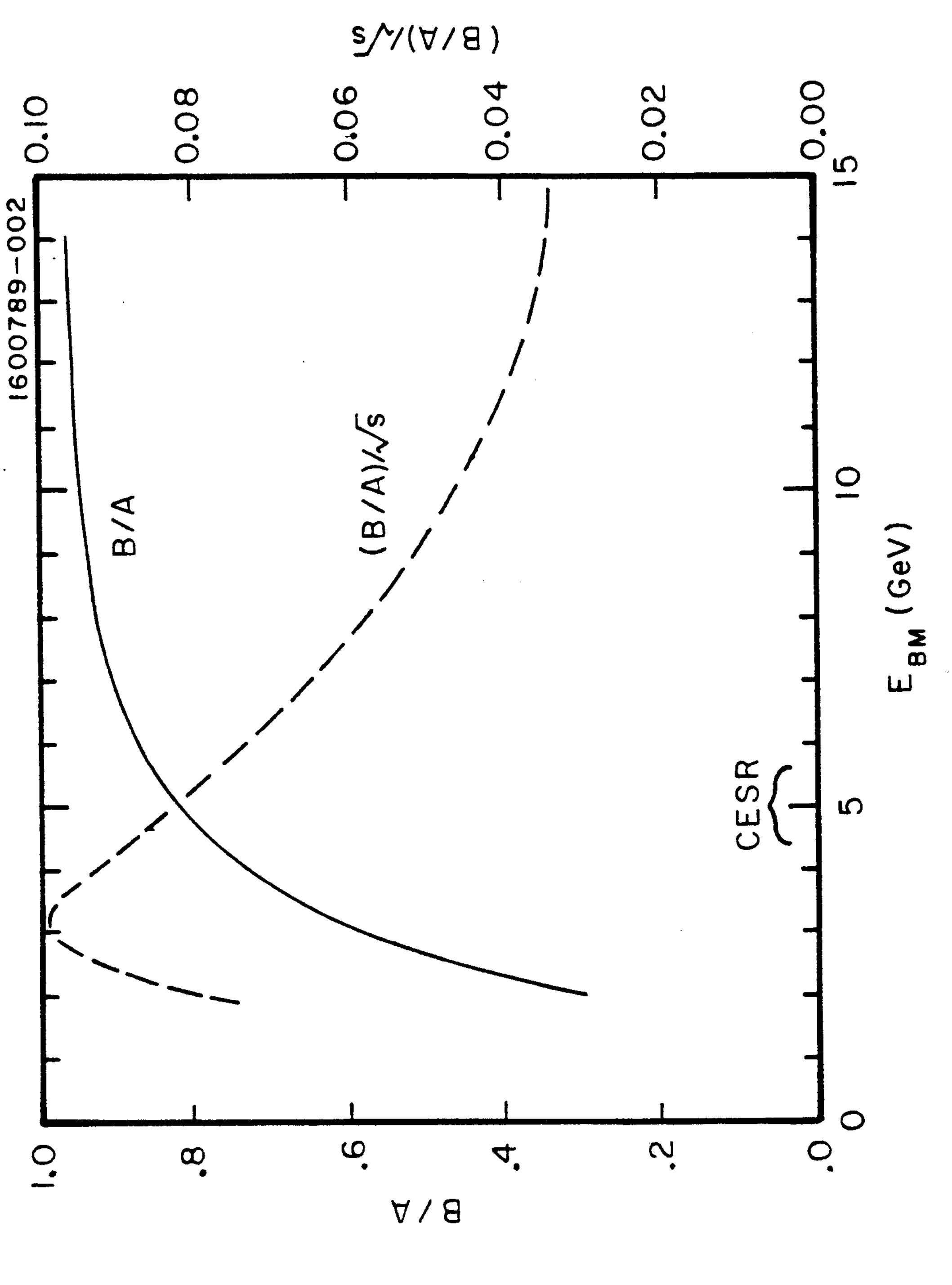

1600789-002
B/A
(B/A)/√s
CESR
E BM (GeV)
B / A
(B / A)/√s
0
5
10
15
1.0
.8
.6
.4
.2
.0
0.10
0.08
0.06
0.04
0.02
0.00

Figure 9

6) A Look at Some Specific Decay Channels

a) Measuring B_K/B_π

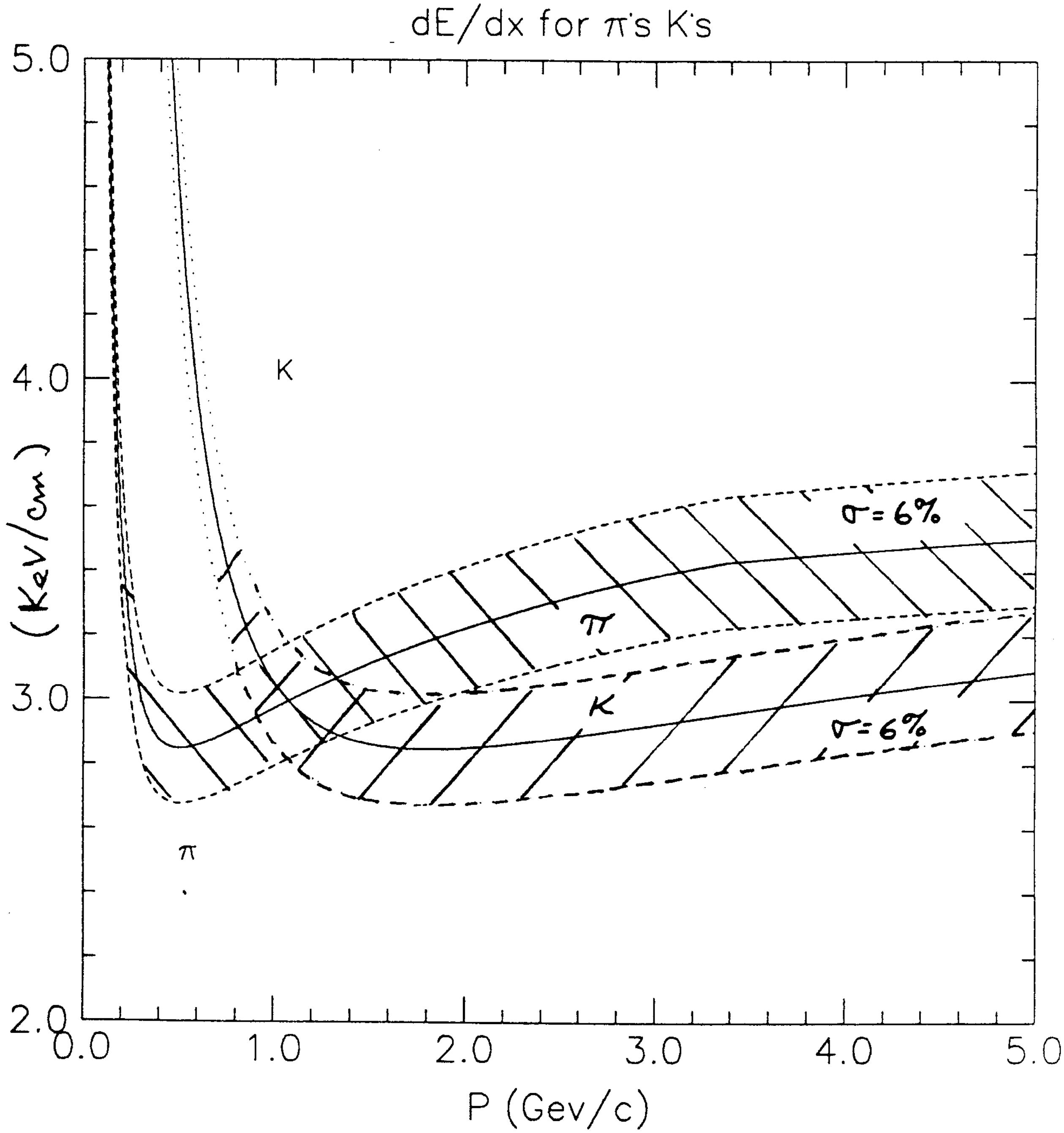
This measurement is important for verifying that the Cabibbo angle is the same in the leptonic currents as in the hadronic currents. This means separating π from K in τ events. Figure 10 shows our dE/dx capability for CLEOII. There is a limited range below 800 MeV/c for which the separation is very clean. However, in two-body τ decays the hadron will have a rather flat momentum spectrum, so most of the K/π separation for τ events will rely on the relativistic rise region above 2.1 GeV/c.

We have looked in that momentum region with the general data sample, which we know has a K/π ratio of roughly 1/6 (compared to the 1/15 or so for τ events). With 42,000 candidate tracks the dE/dX found a shoulder corresponding to K's, but the area of the shoulder was uncertain to 15%. Another potential problem is the relative enrichment of the hadronic background in K's. A careful Monte Carlo study would certainly be in order.

I therefore find it unlikely that we can use dE/dx to determine the ratio B_K/B_π to better than 10% or so.

Here I should reiterate a point about doing τ physics at a B factory. (Almost) nobody in CLEO has any concern in optimizing dE/dx corrections at high momentum since the maximum K momentum form B's is about 2.5 GeV/c. (Almost) nobody is concerned with making the $q\bar{q}$ Monte Carlo accurate for 3 or 4 observed charged tracks since we don't even consider an event for B analyses unless the charged multiplicity is at least 4.

Figure 10



b) Measuring B_{K^*}/B_ρ

This vector ratio is a potential supplement, complement, or replacement to the pseudoscalar one looked at above. If we use the decay modes $K^{*-} \to K^-\pi^0$ and $\rho \to \pi^-\pi^0$ we are confronted with the same problems discussed for the pseduoscalar ratio. If we instead find B_{K^*} by observing $K^{*-} \to K^0\pi^- \to \pi^+\pi^-\pi^-$, we will lose the ability to cancel many of the systematic uncertainties associated with finding and measuring π^0's. For further information on the state of this ratio, see the recent ARGUS[14] publication.

Here again, I think 10% overall uncertainties is about all we can hope to attain.

c) $B(\tau^- \to \omega\pi^-\nu)$

This channel is very important since it is related to studies of 4π final states, η searches, etc.. The present CLEO value[15] of $(1.5 \pm 0.3 \pm 0.4)\%$ is based on some 300 pb^{-1} of data. The present ARGUS value[16] has slightly smaller uncertainties , presumably due to their better electromagnetic calorimetry.

CLEOII will have excellent π^0 detection and measurement and a much larger data sample. I see no reason why by 1992 this branching fraction will not have statistical and systematic errors of ± 0.1 and ± 0.2 respectively.

d) Purely Leptonic Decays - $\tau \to \ell\ell\ell$

Decay channels such as $\tau \to \mu\mu\mu$, μee, etc., are important for models involving violation of individual lepton number and for certain cosmological appplications. Preliminary CLEO limits for such processes are on the order of $2 \cdot 10^{-5}$, with no candidate events observed. Since we do not seem systematically limited, CLEOII should be able to lower these limits by roughly the amount of luminosity collected; by 1992 this should be at the level of $2 \cdot 10^{-6}$.

7) Looking at an Unbiased τ Sample

As explained in Hayes' talk in the plenary session, it is useful to have an unbiased sample of $\tau\tau$ events. One important use of such a sample is to determine all the τ ranching fractions simultaneously in the same experiment.

Along those lines we are contemplating using the vertex capability of CLEOII to produce an unbiased sample of 1-vs-3 $\tau\tau$ events by demanding the vertex of the three charged tracks be displaced from the nominal beam position. This will effectively eliminate our largest source of background, namely $u\bar{u}$ and $d\bar{d}$ production.

How well this will work depends on how well we can measure such a vertex separation. To make the eventual sample of τ's as unbiased as possible we wish to loosen the present set of cuts employed; our preliminary indication is that this will give us a starting point of equal signal to background from which to investigate the vertex information. With CLEOI capabilities we could only hope for a further 10:1 rejection of light quark backgrounds via the vertwex requirement. However, with the improved vertexing of CLEOII (see Kass' talk for more details) one could achieve 150:1 rejection while keeping 3% of the 1-vs-3 events, or a total sample size of some 14,000 τ's.

Of course, there remains the problem of $c\bar{c}$ backgrounds which have similar lifetime to the $\tau\tau$ events. What cuts can be applied to the three prong side to reduce this contamination is under investigation.

8) Other τ Analyses

Given their low multiplicity, $\tau\tau$ final states provide an excellent laboratory for probing the weak hadronic current. Much of this was discussed in the plenary talk of Barish and in the review paper[17] he wrote with Stroynowski. For example, there is the precise measurement of the parameters of the a_1 resonance, still an unresolved issue. Measurement of the spectral functions seems to be very important (see the talk of Pich to this working group), particularly as they apply to certain sum rules. Doing a credible job on these functions will require good separation of vector from axial-vector components (not yet attempted by CLEO) and separation of the strange and non-strange components (not easily done even by CLEOII - see discussion in section 6).

One other aspect of a different nature deserves mention - namely the production of τ pairs by Υ resonances. CLEO has published results for the $\Upsilon(1S)$[18] and $\Upsilon(2S)$[19]. As mentioned earlier, the first CLEOII running will be a large sample of $\Upsilon(3S)$, from which we hope to extract $B(\Upsilon(3S) \rightarrow \tau\tau)$ using both 1-vs-3 and e-vs-μ final states. This is certainly one universality test which a τcF can not possibly do!

9) Other Constraints of Working at a B Factory

At facilities working in the Υ region, B physics naturally dominates. From the standpoint of personnel this has several ramifications. For one, there is little graduate student interest - they do not see τ analyses as "state of the art". Those who do choose τ projects are not pushed by the group at large or by analysis co-ordinators because there is, in general, no sense of urgency associated with these analyses. "Support services", such as tabulation of particle identification efficiencies, are also done largely with B physics in mind.

Monte Carlo is another "support" area of concern. Large numbers of events need be generated to handle the large τ data sample. These are in addition to the massive number of $B\bar{B}$ and $q\bar{q}$ events being generated at a higher priority for doing B physics. Management of the Monte Carlo data bases is also geared toward B physics; the energy spectrum for $B \rightarrow D^0X$ will clearly get more scrutiny than the proper mimicing of the shape of the a_1 in τ decay.

There are also more general pressures from B physics. For example, if the trigger rate for low multiplicity events becomes very high and causes large dead times, the pressure will be to make the trigger more restrictive to maximize $B\bar{B}$ production at the expense of some $\tau\tau$ final states. If tape writing becomes excessive there will be pressure to pre-scale "uninteresting" low multiplicity QED events, including $\tau\tau$ events. As fewer types of τ events are stored, fewer people stay interested in τ analyses and it becomes easier and easier for the majority to impose its will - a vicious cycle.

Nonetheless, I feel there is a lot of useful τ physics that can be done at CESR and at future B factories. It is up to those interested in the subject (like me) to have the necessary diligence, planning, persuasivness, and energy to see to it that actually happens.

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