Minutes of the $Z \to q\bar{q}$ meeting

CERN, 12 April 1989

Copies of all transparancies shown during the meeting are attached to these minutes.

1. Alain Blondel starts with some introductary remarks. He reminds us that this working group should find an answer to Jack Steinberger's questions: what can we do with $100/300/1000/3000 \; nb^{-1}$? And: how do we want to have the luminosity distributed around the Z peak?

2. Alain Blondel reports about *uncertainties on* Γ_Z^{th} *once* M_Z *is known to* $\pm 100 MeV$. It turns out that the main uncertainty comes from the dependence on the top mass, the Higgs mass and the ρ-parameter, contributing together about $20 MeV$. The total uncertainty is about $25 MeV$. Concerning the scanning strategy, Alain concludes that the peak and the points at $\pm 2 GeV$ are best suited to minimize the errors on Γ_Z. Other systematic errors on Γ_Z are due to the point-to-point error on the luminosity measurement ($25 MeV \times$ point-to-point error in %), and due to the point-to-point error on E_{CM} ($\frac{3}{5} \times \Delta E^{point-to-point}$).

3. John Harton describes his program $EQ02$ that is used for computing the line shape. It is based on $EXPO02$. He compares the results with those obtained from $ZBATCH$, and finds that they agree within 0.1% around the Z peak.

4. Lluis Garrido gives a report about the *status of the line shape software*. There are 7 programs which he did use and compare with each other. He continues with a discussion of the error on M_Z due to the absolute energy error of LEP and the error on the lumninosity. Lluis then presents a possible scanning strategy to get $\Delta M_Z \approx 100 MeV$. He shows how the errors of M_Z, Γ_Z and N_ν depend on the luminosity error and systematic point-to-point errors, and what errors can be obtained with different integrated luminosities. After a lively discussion Lluis promises to write a short note where he will explain more of the details of his work.

5. Fred Bird reports about *luminosity studies*. He shows distributions that were obtained with the Bhabha generator BHLU01 and with von Holtey's generator for off-momentum electrons that was adapted to ALEPH by the Heidelberg group. As an example, the rate of overlap between Bhabhas and background from off-momentum electrons turns out to be only $10^{-4} Hz$. Synchrotron radiation will contribute about $10 MeV$ per crossing. This poses no problems for the LCAL, but may cause trouble in the SATR. Fred then describes a method that allows to define the acceptance of the LCAL by using the LCAL alone. The first results are rather promising, and the work on this topic will continue.

6. Eberhard Lange gives *news about hadronic event selection*. He has generated and analyzed 1000 Lund events with JULIA and 10000 events with SIMDST. The obtained distributions are quite similar. He then proposes a idea to suppress background from Bhabhas more efficiently. Finally, he generated some events off the peak. No obvious differences are found in a comparison with the on-peak events.

7. Edward Blucher continues with the discussion about the event selection, and reports about trigger studies done by E. Lancon and P. Perez. He points out that a big GALEPH production will take place on the Cray in the near future, and that people should contact him very soon if they have suggestions or ideas.

8. Monica Pepe talks about the *energy reconstruction*. The idea is to

measure the energy of charged tracks with the ITC and TPC, and to get the neutral energy from the calorimeters (after correcting for the charged tracks). Monica shows distributions which she obtained with the available code (in JULIA and ALPHA).

9. Alain Blondel closes the meeting by expressing two of his main worries: somebody has to study the charge asymmetries, and we have to understand what really comes out of JULIA.

10. The *next meeting* is foreseen for the 10 May, in the afternoon. (N.B.: the next QCD meeting takes place on the same day.)