

MINUTES OF HEAVY FLAVOR MEETING
CERN 10 JULY 1991

Recorded by Tom Mattison

The agenda was a presentation on the use of the standard MINI-DST for heavy flavor analysis by Alain Falvard followed by a discussion, a summary of the Orsay conference by Roger Forty, a presentation on a proposed addition to the D^* analysis by Dominique Pallin, an update on the Λ_b analysis using the 1991 data by Mossadek Talby, a VDET data status report by Dave Brown, and a summary of the recent particle ID status meeting presented by Peter Dornan.

The MINI will be increasingly important as statistics increase, and it is useful for all groups to have the identical MINI. Tracking and lepton ID on the MINI seem adequate, but the status of fits using the VDET is less clear at the moment. Two different energy flow results are available, but Patrick Janot's algorithm with its recent improvements is not. A decision is necessary, and soon, about what to include. This is also true for photons and pi-zeros.

The present MINI has fits with no VDET information used. The present plan is for future MINIs to have ONLY fits with VDET information, when this is considered satisfactory. There is no mass produced Monte Carlo MINI, largely because of the changes in QMUIDO. Monte Carlo truth banks will be on the MINI. V-zero banks are synthesized from other track bank information, and enough input information is available to re-run V fits on the MINI. About 1/3 of the time is spent reading, 1/3 on filling DST banks, and 1/3 filling POT banks from DST banks. It is also possible to read the MINI directly rather than through ALPHA, which is substantially faster at the expense of compatibility. Private format nano-DSTs will always be faster, at further expense in compatibility.

The philosophy has been for the MINI to be a reduced copy of the DST, with minimal reprocessing. DST to DST reprocessing is being considered to redo fits with consistent VDET-ITC-TPC alignment. It would also be possible in principle to add another energy flow result this way, but doing large amounts of DST to DST processing with large programs requires large amounts of time and attention to book-keeping.

A bank of photon and π^0 information could be added, but the bank must be kept small, and preferably should be created at the JULIA level. At present, very few people are using π^0 or photon information for analysis. There are two π^0 algorithms under study, not necessarily for high multiplicity events. One is better at high energy, the other at low energy.

A decision about what to do is necessary before August, for both energy flow and π^0 s. People should start talking next week!

Roger Forty's Orsay summary was divided into charm, beauty, tau, top, and future possibilities. Transparencies are appended.

Dominique Pallin presented studies of the possibility of separating D^* production from primary b and c quarks. The present D^* analysis simply assumes the ratio is $.95 \pm .1$ after the cut at $X=.25$. It is possible to fit not only the X distribution of D^* , but also the boosted jet sphericity product distribution to measure the b/c ratio at the same time. The b/c fit is consistent with the value assumed in the paper, but the error is twice that assigned to the assumed value. Perhaps not coincidentally, the error on the charm fragmentation parameter c_e is also not improved.

There was discussion of whether this was an appropriate addition to the D^* result for Geneva. The analysis is rather complicated for a rapporteur to do justice to in the available time, and the end result is only a check on the assumption about b/c that is not strong enough to confirm the uncertainty assigned to the assumed value of b/c.

Mossadek Talby presented the 1991 data update of the Λ_b signal from lepton- Λ_b correlations. A cut on lepton P_t reduces background from Λ_c from B-meson decay and direct Λ_c production, and also on wrong sign leptons from Λ_c decay. A subtraction of the wrong sign

combinations leaves an excess of 61 ± 13 events in the 1990 data. The same analysis with the 1991 data (before the reprocessing) gives an excess of 7 ± 9 events. The sum is still statistically significant, although obviously less so than 1990 alone. The shape of the Λ_s peak for the 1991 wrong sign data seems wide, although statistics are low. There are more wrong-sign events than predicted from the 1990 rate, and fewer right-sign events.

Dave Brown presented a "VDET pep talk." The VDET data is present for 70-80% of the 1991 data, and quite few of the modules have serious problems. A short example analysis using VDET data to measure the beam spot size was shown, which shows the VDET is accurate enough to see the vertical beam size as being inconsistent with zero. Including an FRF2 card in ALPHA jobs will fill track banks from fits with VDET data included (and errors calculated at the origin). Everyone is encouraged to start using VDET information NOW.

Peter Dornan summarized the particle ID status. More transparencies are appended than were actually shown in the meeting. The discrepancy between e and μ in the 1990 data is now understood. The problem was a QMUIDO/Monte-Carlo bug for muons in a limited angular region outside the barrel. The 1991 data R2 distribution has a different shape in the hadronic region than older data, but perhaps OK in the electron region. The R3 distribution has somewhat worse problems in the electron region. Checks with conversion electrons show a .5 sigma shift in the barrel RT distribution, and a 30% increase in the endcap RT sigma. The latest JULIA has some new corrections added to dE/dx , which change calibrations and will be useable after the database is updated in a few days. More tracks should now have dE/dx information than before. The resolution should be 4.6% for 150 samples. The second layer of outer muon chambers is now present in the data. This improves the muon efficiency from about 75% to 85%. Using the exit angle information when both layers have hits improves the purity by a few percent at a tiny cost in efficiency.