Samo Korpar, Beam test prep. meeting, Feb. 6, 2004

Some input for the experience summary of the Nov 2002 beam test and discussion of last week.

Sychronisation of events
In about 1/3 of events with shifted buffer, ADC data were not synchronised with the rest of event. Therefore all shifted events had to be discarded. On the other hand, all unshifted events were synchronised with the rest of event.

Buffer shift problem
High efficiency of runs around 150 (=lower rate of shift buffer errors): there we were taking data at low momenta, most probably lower trigger rate.

If the problem in the buffer shift is indeed strongly correlated with the trigger rate, a higher beam rate as expected in this coming beam test would cause even more problems, lower efficiency, if we do not find a solution.

How to test this: use two trigger pulses in sequence, vary the delay of the second. Other possibility: use a random trigger instead of a regular pulse generator, vary average rate (we are working on a NIM module which does this, will be ready next week).

The other possibility is that the shift buffer error becomes more probable if the occupancy of the photon detector is high. This does not seem to be supported by the data (we observed a more or less constant fraction of events with errors, independent of aerogel sample, thickness). Also, the number of hits per ring distribution would not be Poissonian any more (less events with more hits).

Multihit TDCs could not have caused the problem, since we had no problem in the reading out of MWPCs and RICH2. I also do not see any reason why CAMAC TDCs would be worse than VME TDCs. If these were the source problems, then the lack synchronisation of ADC data vs the rest of event would occour both in shifted and non-shifted events.

Incomplete buffer
Note that there was an additional loss of events (about one third?) for which the buffer length was even below 255 (should be 256). They were

rejected before they were written to disk. Also: this kind of troubles were already seen in the lab tests before the beam test started.

Preparation of beam test
I plan to arrive on Thursday, Feb. 25, and could start serious work on the DAQ diagnostics on Friday. We then have 4 days for tests and debugging, enough time.

It would be nice if work is organized in such a way, that no other studies are carried out during this four days.