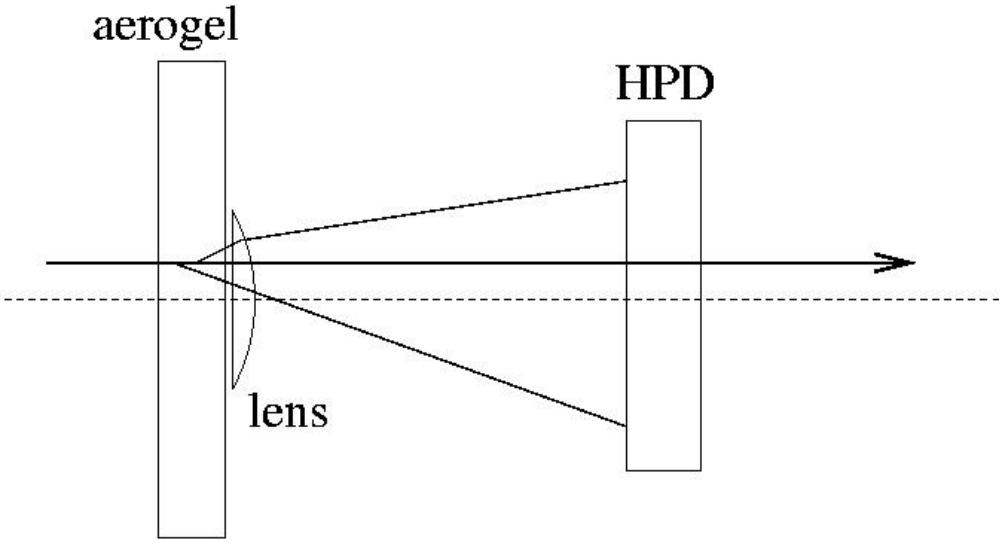
BEAM TEST 2004 PREPARATION

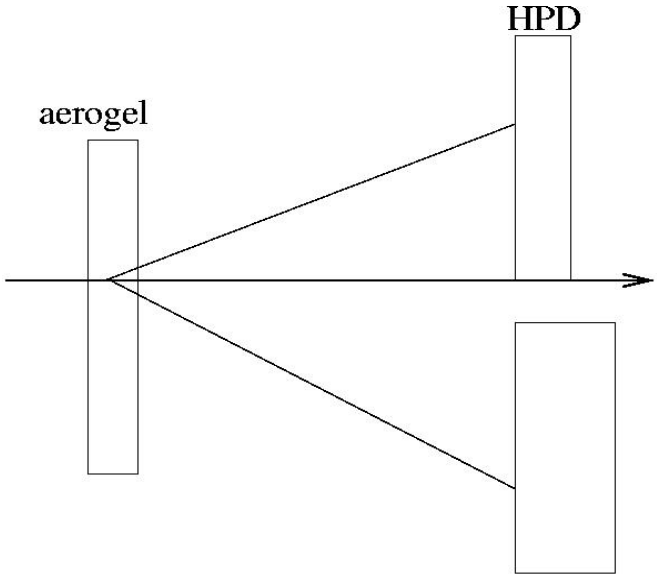
Proposal of a set-up to avoid the focussing mirror

Rings with a lens



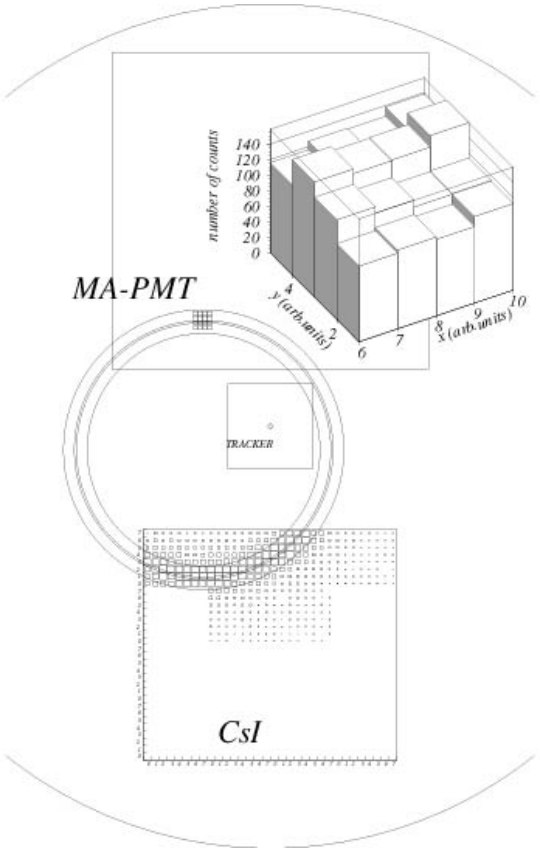
To get the full ring on the HPD, we need a lens with a focal length of about 10cm – we have it already!

Same set-up, version without the lens: use PMTs as a referrence, measure in parallel, part of the ring is covered by PMTs, part by HPD.



Advantages:
In the same set-up it is possible (with minimal modifications, short swapping time) to
-compare the investigated photon detectors
-image full rings on the new photon detector

Experience with such an arrangement
When R5900-M16 multianode PMTs were a new, not yet well tested device, we have used a CsI based photosensitive MWPC to determine PMT efficiency.
CsI chamber was used to determine the lower part of the Cherenkov ring, while a short segment of the ring was covered by the MA-PMT.



Plans for the March 2004 test

What remained to be understood from the previous beam test:

- 6mrad contribution to the resolution
- 12mrad vs 14mrad (is it front face vs. back face)

What else do we want to measure:

- uniformity of the radiator
- boundaries and corners, square and hexagonal tiles
- dual radiator, both set-ups
- part of the ring with the Burle 64 channel MCP-PMT

Measurements:

- Aerogel uniformity: Scan over the full aerogel tile with enough statistics
- Same tile back vs front face, several samples
- Dual radiator set-up two rings, few inc. angles
- Dual radiator set-up focusing, few inc. angles
- Lens as a focusing device – test for the June HPD beam test, maybe try it on the Burle MCP-PMT

Statistics needed

- Uniformity: <5% error on $1cm^2$-> 1000 events -> 100k for each tile
- Boundaries: similar requirement

All in all: need several M. Last time recorded 2.8M, sounds OK.

Run 2002 experience: see fig. below

Total event recorded: 2.867.149
Accepted events: 7%

Legend to plots:
*left plots: quantity as a function of run number
*right plots: quantity distribution

Rows:

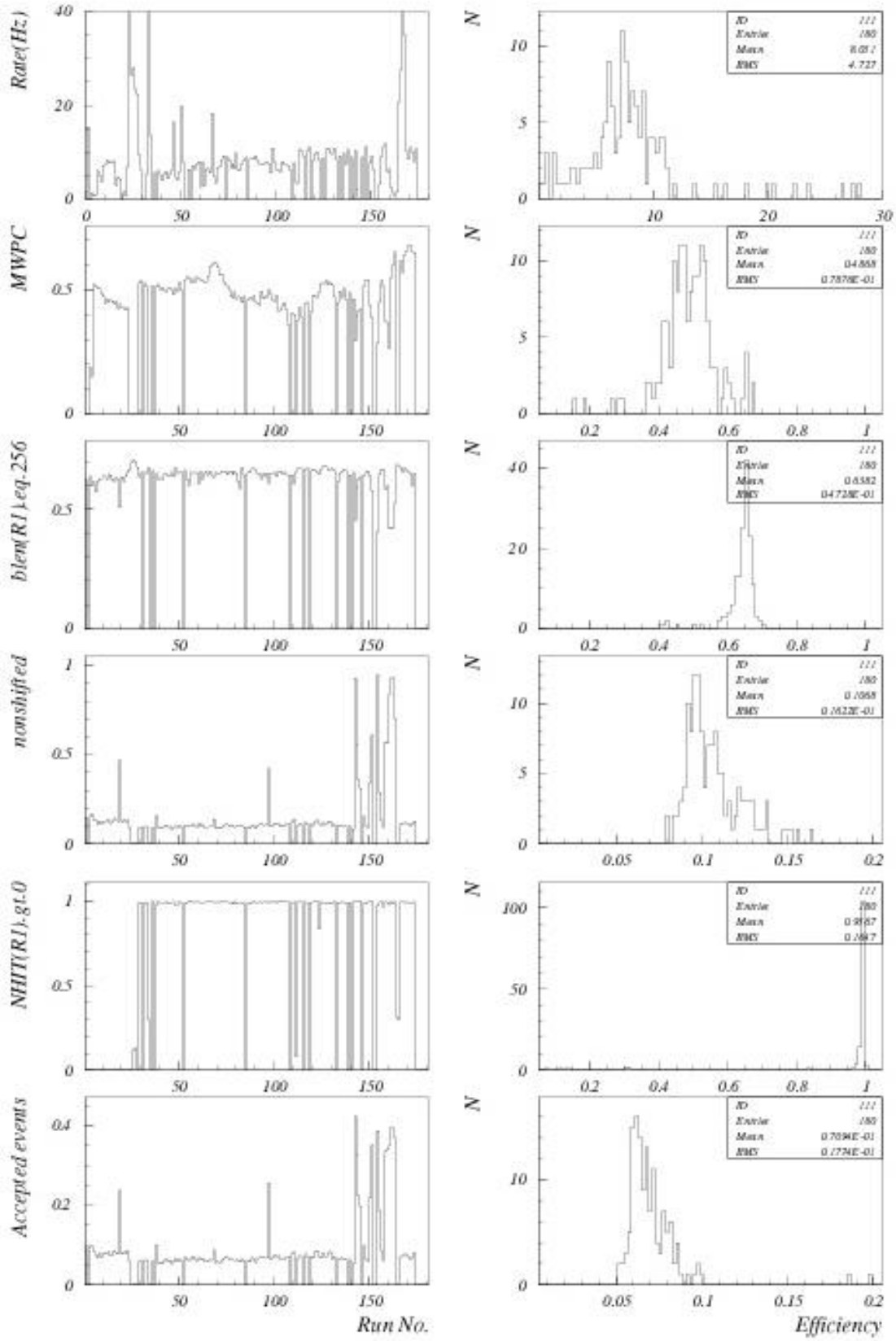
Rate: Data Taking Rate
MWPC: Efficiency for reconstructed track
blen(R1).eq.256: Fraction of events with all Flat panel ADC information
nonshifted: fraction of useful events without buffer shift
NHIT(R1): fraction of events with at least one hit in RICH 1
Accepted events: Number of accepted even

➔ needed a higher efficiency

For the next beam test

- modify the trigger – include MWPC (was done at the end of the beam test in Nov 02 – see the increase in performance)
- work on read-out: fraction of events with complete ADC information from RICH1
- work on read-out: repair the problem of the shifted buffer

Beamtest 2002 - Run Efficiences



Beam test preparation meeting at KEK, Jan. 30, 2004

Adachi: date will be March 3 (or 4) until 10 (or 11?), in the middle break for PS machine studies. Guaranteed 20 shifts. Feb. 3: we will know details. We are sole users, can move the apparatus upstream, expect a much better beam (less spread out, higher rate).

Peter presents a proposal of a list of aims, required statistics, and experience summary of the Nov 2002 beam test.

Discussion what could be done to improve the DAQ rate.

- Higher rate expected because beam conditions (see above)
- Matsumoto: expect to increase the fraction of events with complete ADC information from RICH1, will work on that, less chance to repair the more serious buffer shift problem
- What is the reason for the buffer shift problem? There seems to be no problem during on-the-bench tests, with VME TDC read-out, read out by a PC. Use of ADC with fifo? Long cables? Are multihit CAMAC TDCs the reason for trouble? What was the reason for good efficiency in rund around 150?
- Iijima: If the use of CAMAC TDCs is a problem, could we switch over to VME only? We had problems in the first beam test: ask Samo. Also: is the problem the specific model (CAEN)?
- Will discuss these issues again next Friday, last chance before the equipment is shipped to KEK.
- Mastumoto plans to continue PMT gain and homog. tests for the next two weeks. Peter: could this tests

be done later, and we first try to solve the DAQ issues?

- Matsumoto: further issue: 2 analog. mem. are broken, have to replace them, after that no spares left!
- Any chance that Samo comes earlier so that there is enogh time for the preparation and test in the lab?

Adachi: aerogel status. We will have the same set of aerogels available as last year. In addition we have

- 4x4x1 cm**3 samples of n=1.05 and 1.06
- we might get some more from a batch of mid Feb.
- hexagonal tiles: cutting will be tried
- glued on support: no suitable glue has been found up to now, will try DP190, solid glue used in ACC

Matsumoto: RICH1 photon detector has been modified, can be shifted at larger angles back into the beam, we can now take data at angles up to 30deg.