

October-2001 Testbeam Summary

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Outline

- *Testbeam goals*
- *Setup*
- *A first look at the data*
 - *Silicon sensor*
 - *Beam profile monitor*
- *Conclusions*

Testbeam Goals

- *test prototype sensors with Beetle readout*
 - ☞ *short ladder*
 - ☞ *long ladder*
- *integrate with ODE*
- *integrate into existing infrastructure*
- *characterize sensors as function of HV*
 - ☞ *efficiency profile*
 - ☞ *S/N*
- *readout sensors with SCTA*
 - ☞ *inner tracker prototype sensors*
 - ☞ *GLAST detector*
- *SCTA long cable test*

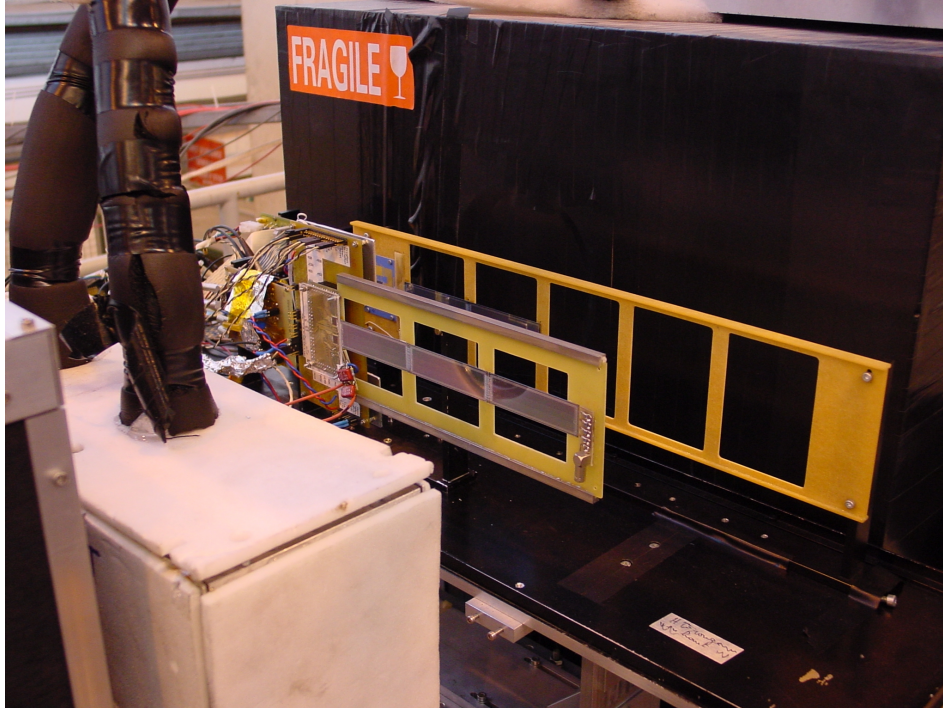
needed massive help from outside ITR-group!

- *VELO group - Paula, Uli, Chris, ...*
- *ODE group - Olivier, ...*
- *ASIC-Lab HD - Daniel, Sven*
- *Testbeam support - Sascha, Clara, Rolf, ...*

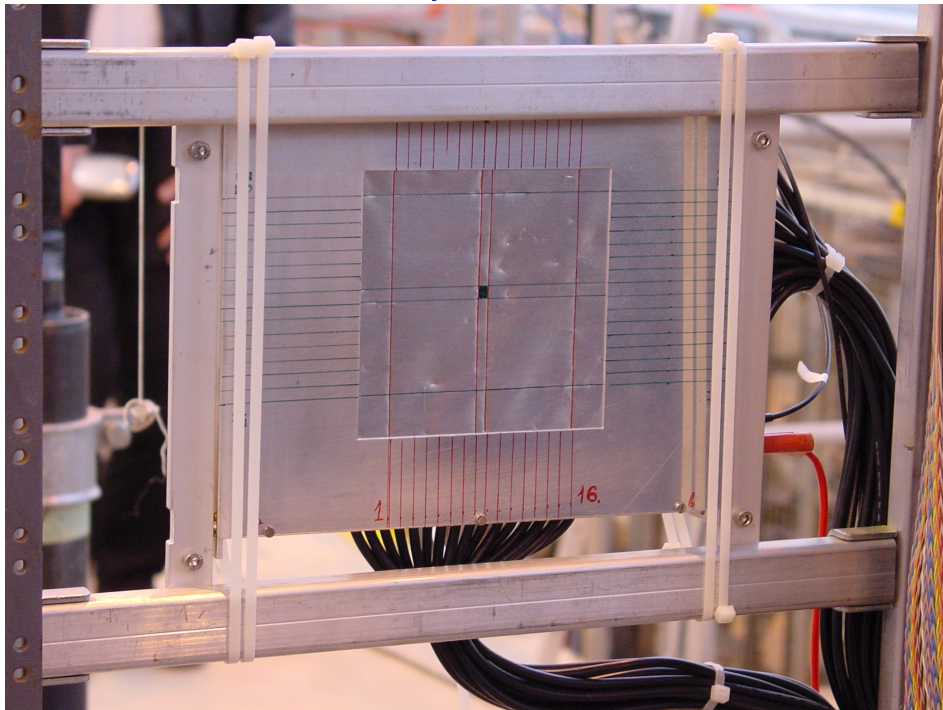
many thanks to all! - also those not
mentioned above

Experimental Setup at X7

Setup with the long ladder



The beam profile monitor



Results from long ladder silicon sensors

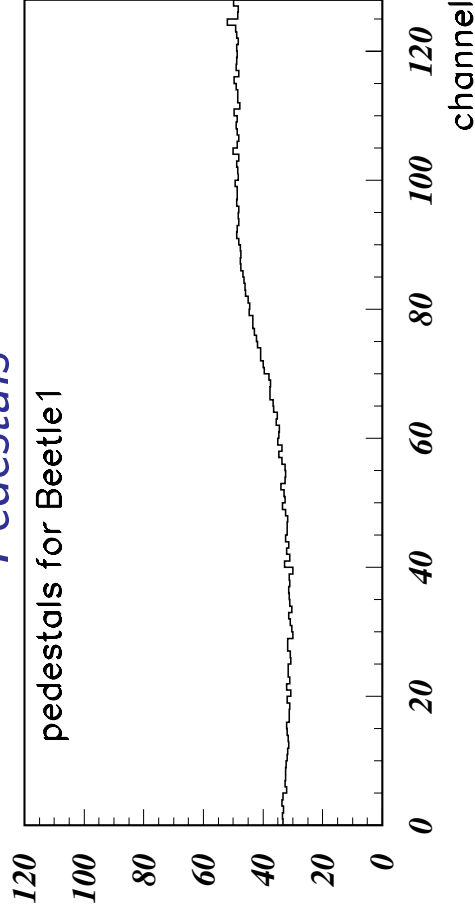
- *use tracks defined by VELO telescope*
- *study correlations with Beetle data*
- *strip relevant information for analysis*
 - ☞ *1 GB raw data for 50,000 events*
 - ☞ *2 hours processing*
 - ☞ *7 MB stripped data*
 - ☞ *30 seconds analysis*
- ➔ *illustrate data quality/content using run 10224*

all results are preliminary

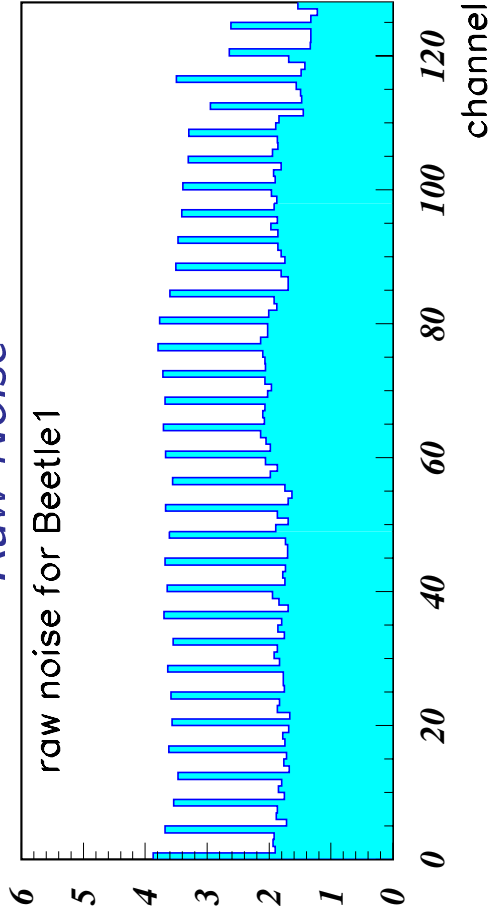
Some details of the analysis:

- *pedestal and noise values determined globally per run*
- *events with large baseline fluctuations are discarded*
- *pedestals from 50% trimmed pulseheight average*
- *bond map inferred from raw-noise pattern*
- *1st-order spline baseline subtraction*
- *cluster finding a la marvin*
 - ☞ *seedcut = 4*
 - ☞ *chi2cut = 9*
- *no alignment yet*
- ➔ *study correlations between VELO and ITR ...*

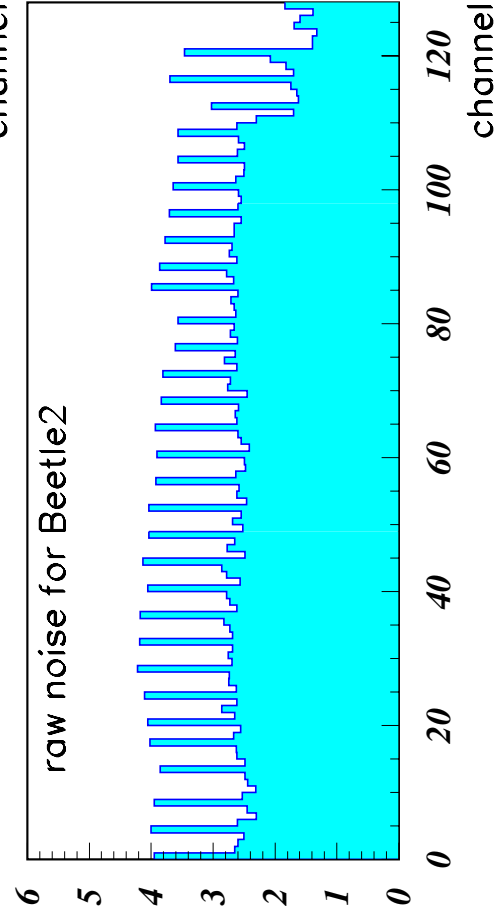
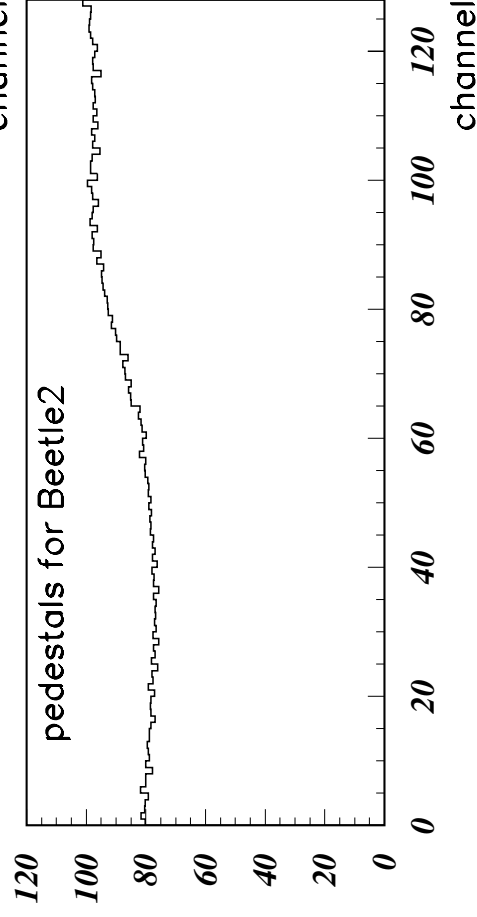
Pedestals



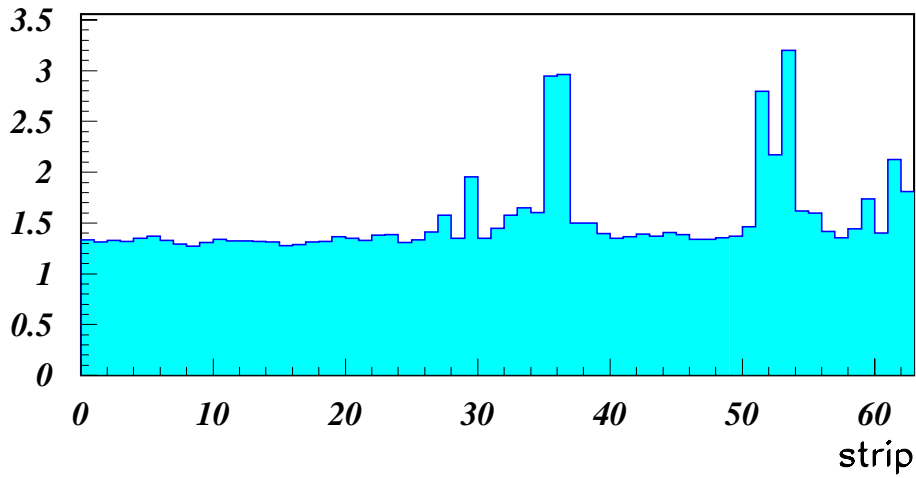
Raw Noise



Pedestals

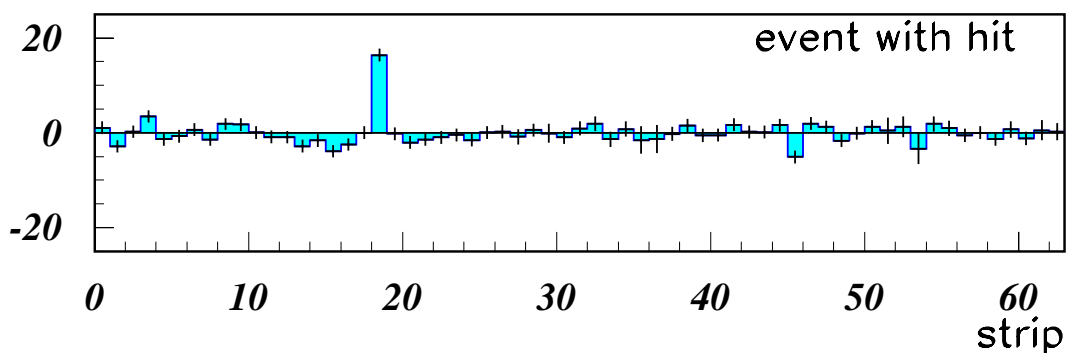
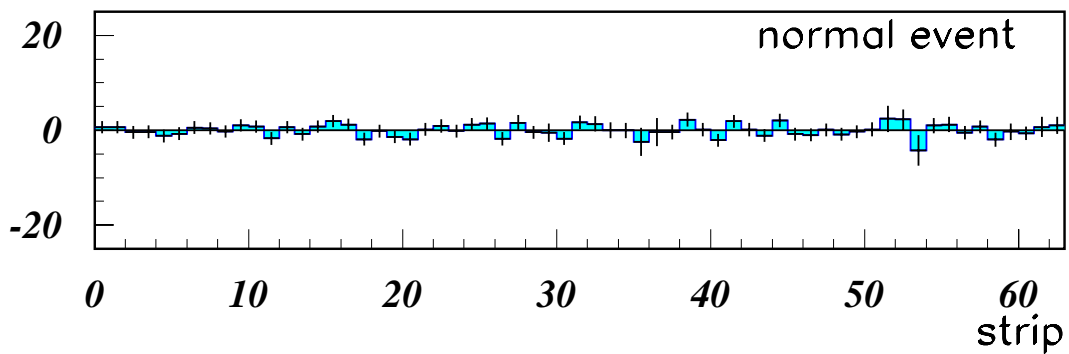
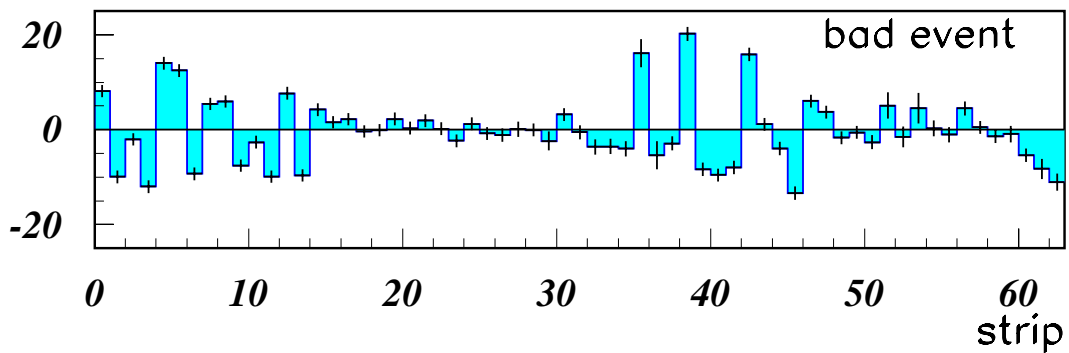


subtracted noise for bonded strips



event displays

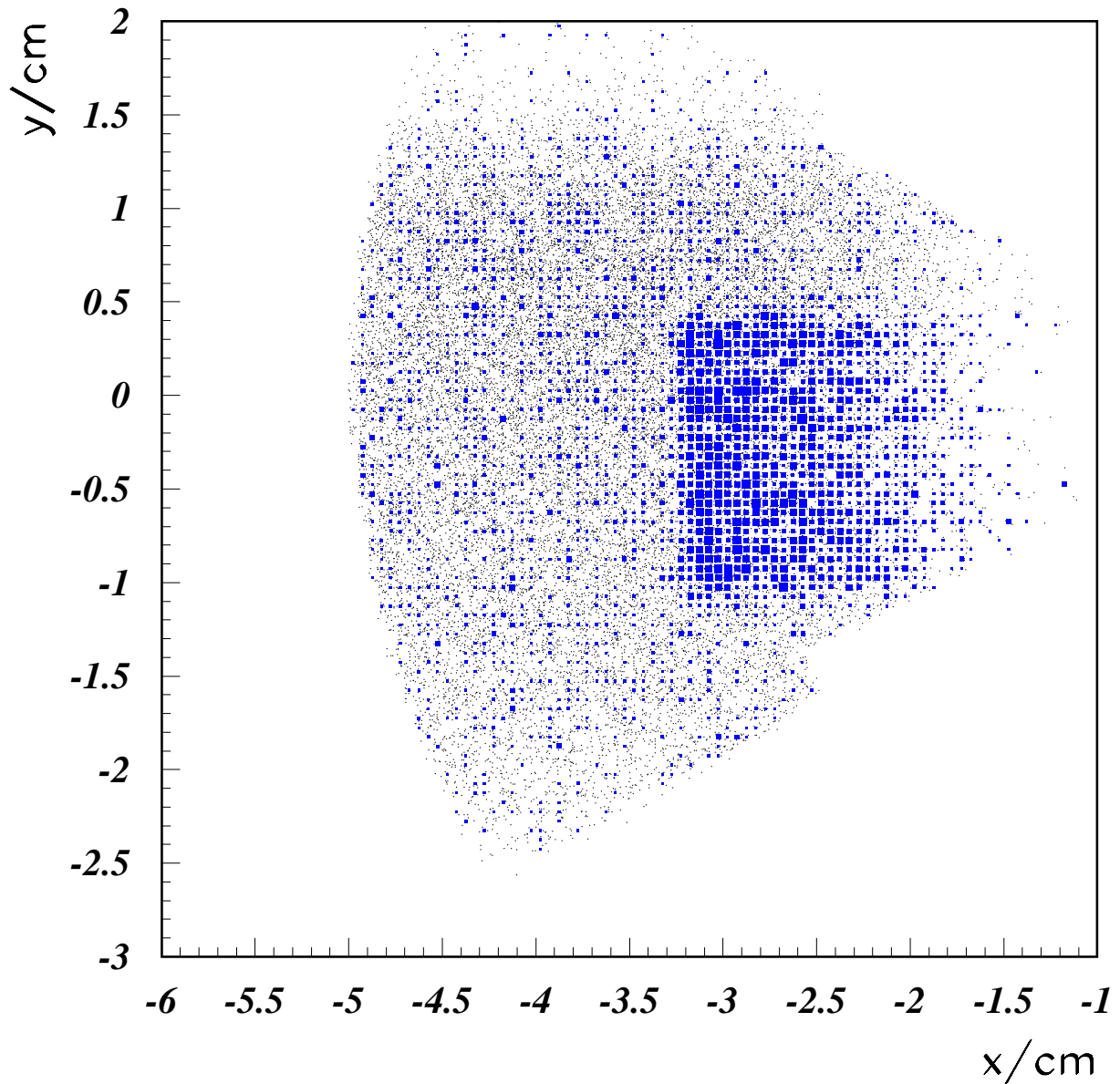
pedestal and baseline subtracted ADC counts



Silicon Sensors

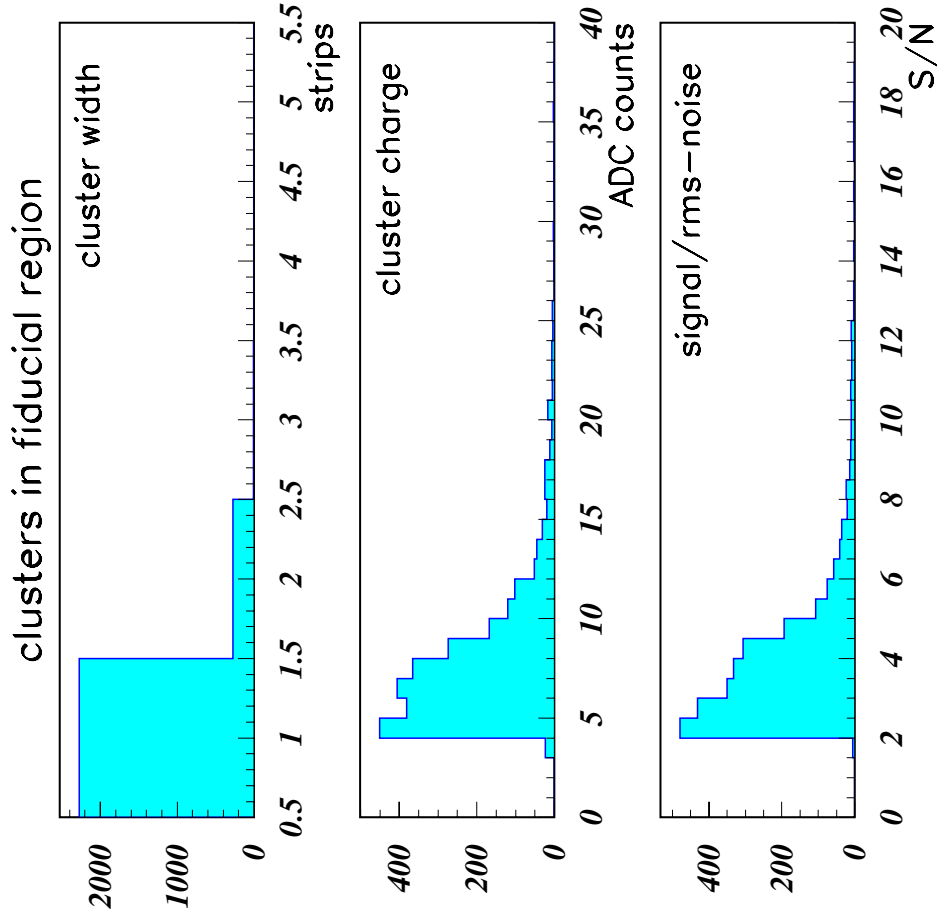
overlap between VELO telescope and ITR-sensors

VELO track impacts and ITR hits

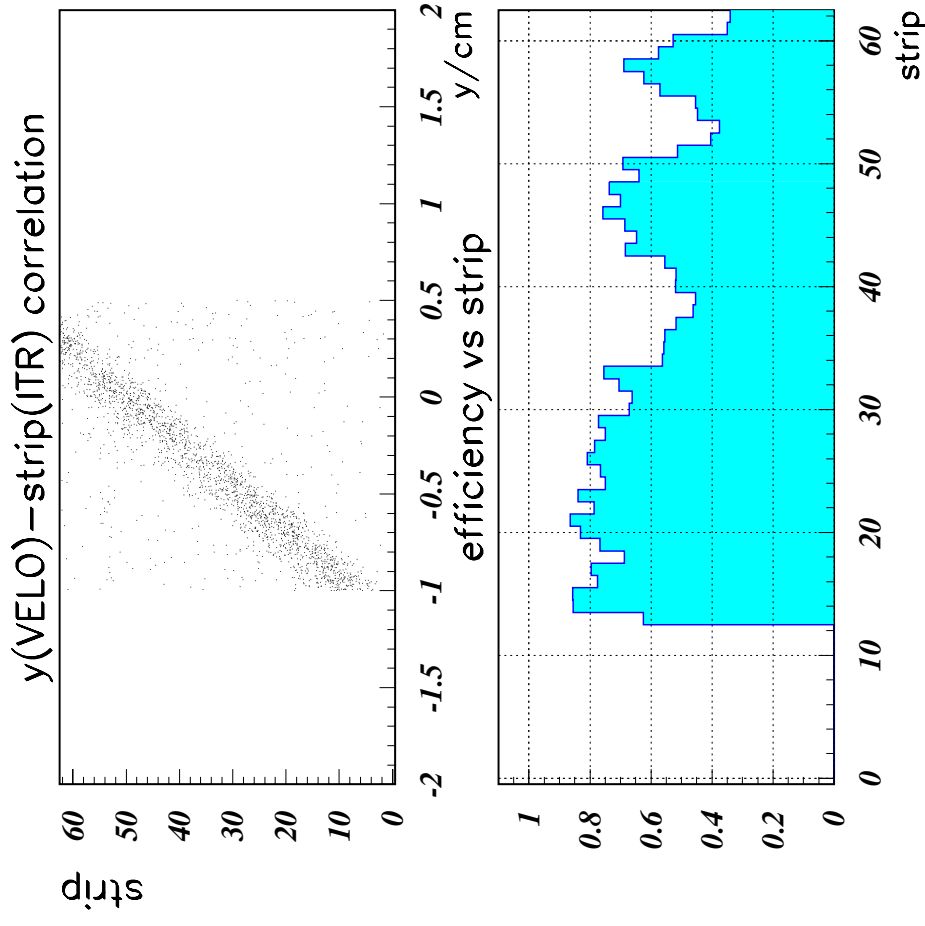


→ study clusters in fiducial region ...

Cluster properties



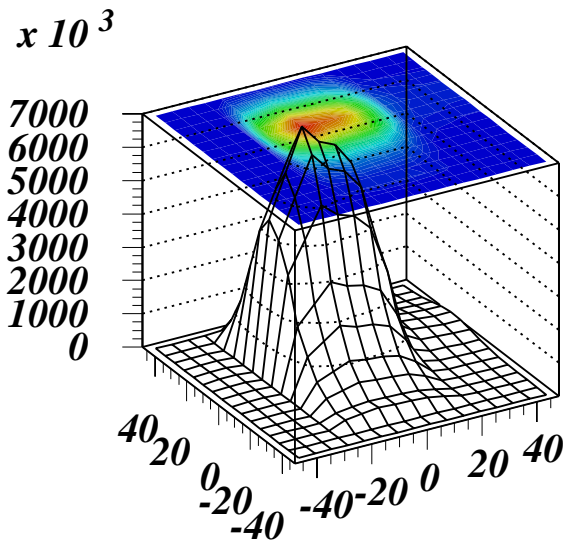
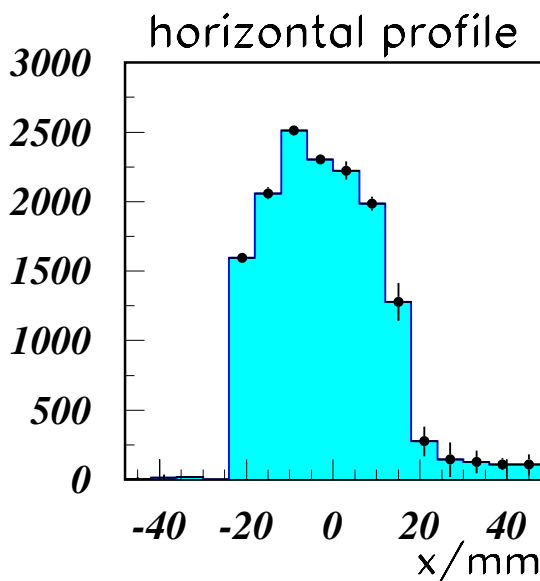
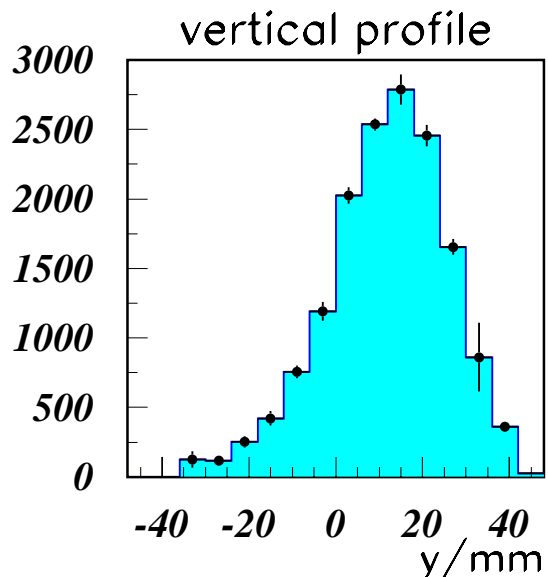
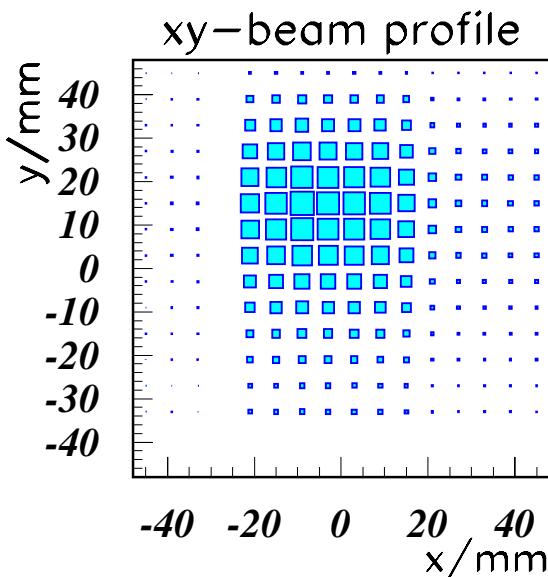
correlation and efficiency



Results from the beam profile monitor

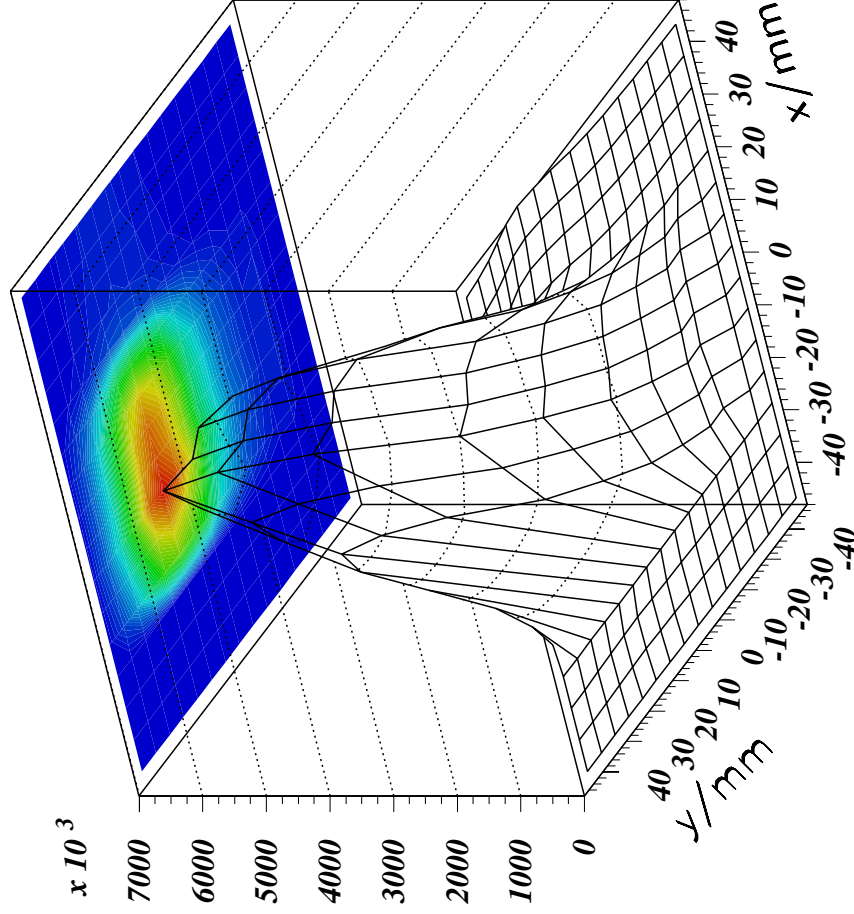
- developed by Valery Pugatch at MPI-Heidelberg
- stable operation during the testbeam period
- precise single spill measurements
- online operation

single spill beam profile – $5.2 \cdot 10^5$ tracks



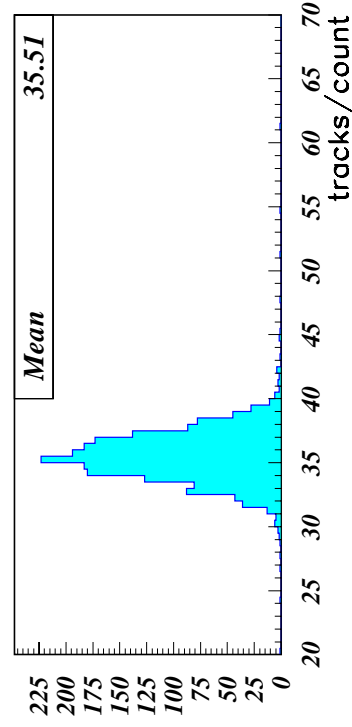
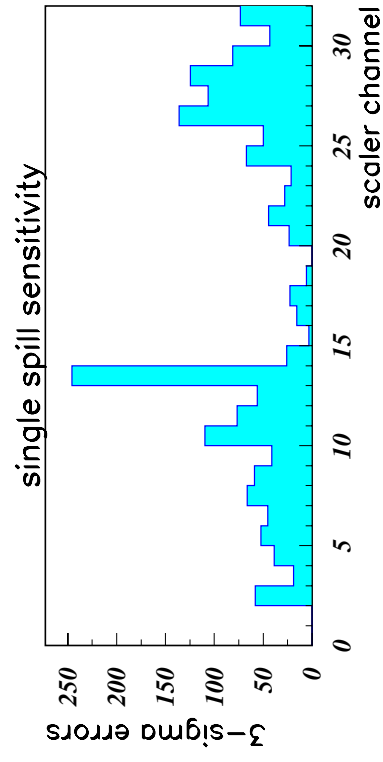
Monitor

xy profile for $5.2 \cdot 10^4$ tracks



sensitivity studies:

- 3σ count-errors from pedestal stability
- tracks/count from scintillator signal



Conclusions

with hard work by dedicated people from many institutes

the October testbeam was successful ...

- *Beetle readout worked*
- *integration with ODE worked*
- *beam profile monitor worked*
- *GLAST/SCTA readout worked*
- *long cable test worked*

but there is room for improvement ...

- ☞ *mechanical alignment*
- ☞ *stable software environment*
- ☞ *less R&D during data taking*

next steps:

- *finish analysis*
- *prepare for next beamtest*
 - *setup DAQ before the test*
 - *bring sufficient redundancy for telescope*
 - *integrate trigger scintillator*
 - *careful geometrical study before running*
 - *prepare monitoring/analysis S/W*
 - *...*