

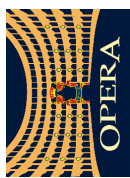


Status – Precision Tracker

Raoul Zimmermann

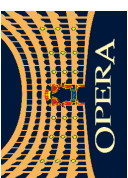
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- money situation
 - readout electronics
 - results from small prototype
 - design and real size prototype
 - summary
-

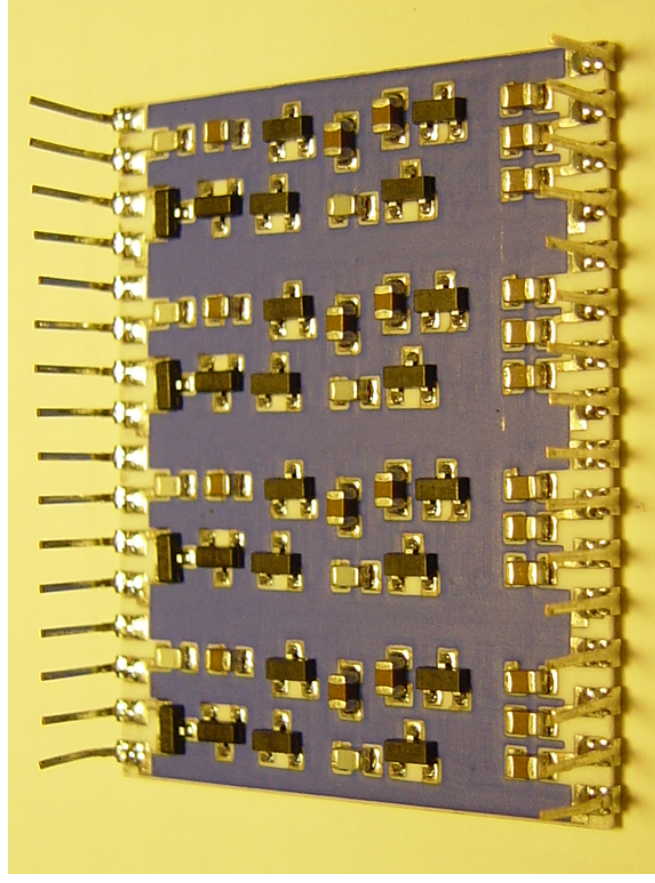
Money situation



- investment money still frozen
- nearly all requirements of the founding agency fulfilled
last open point $\Rightarrow$ **MOU** to unfreeze the money
- founding agency needs an almost finished version

preamplifier

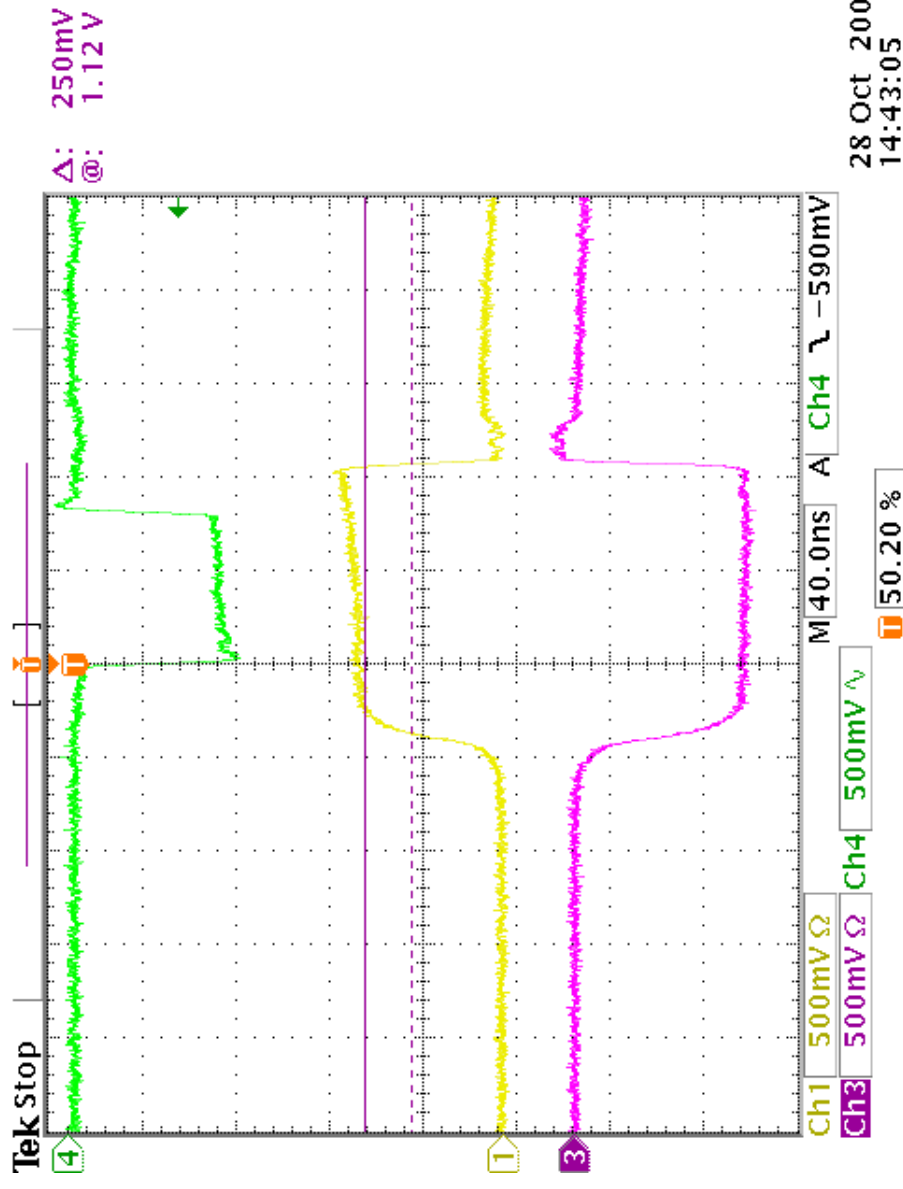
- 3375 L3 preamplifier available $\Rightarrow \approx 13500$ channels



advantage: we have these chips, already used in L3 $\rightarrow$ working

- chips under test

- noise level on 1 m tube: 16 mV (shielding needed)
- V_{th} should be ≈ 50 mV on discriminator (L3 used 40 mV)



28 Oct 2002
14:43:05

next steps:

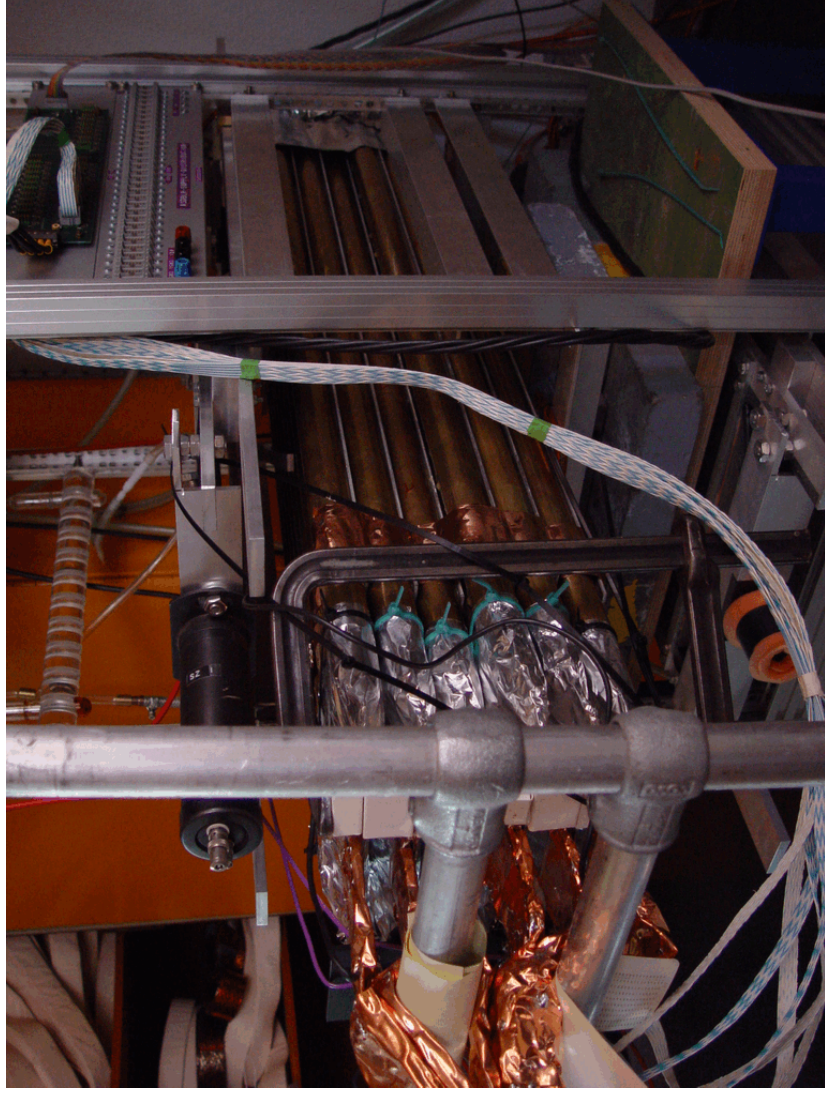
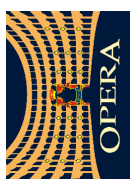
- multilayer HV board
- using discriminator MAX963/961 with real cable length
- test on single 8 m tube, small and real size prototype
- test of whole chain (preamp + discr. + Hera-B TDC)

- design of TDC chips finished
- first engineering samples from NEC arrived
- samples under test at company MSC (test board)

next steps:

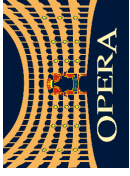
- definition of the interfaces
- requirements of the DAQ
- development of TDC board on the basis of Hera-B design

results from small prototype

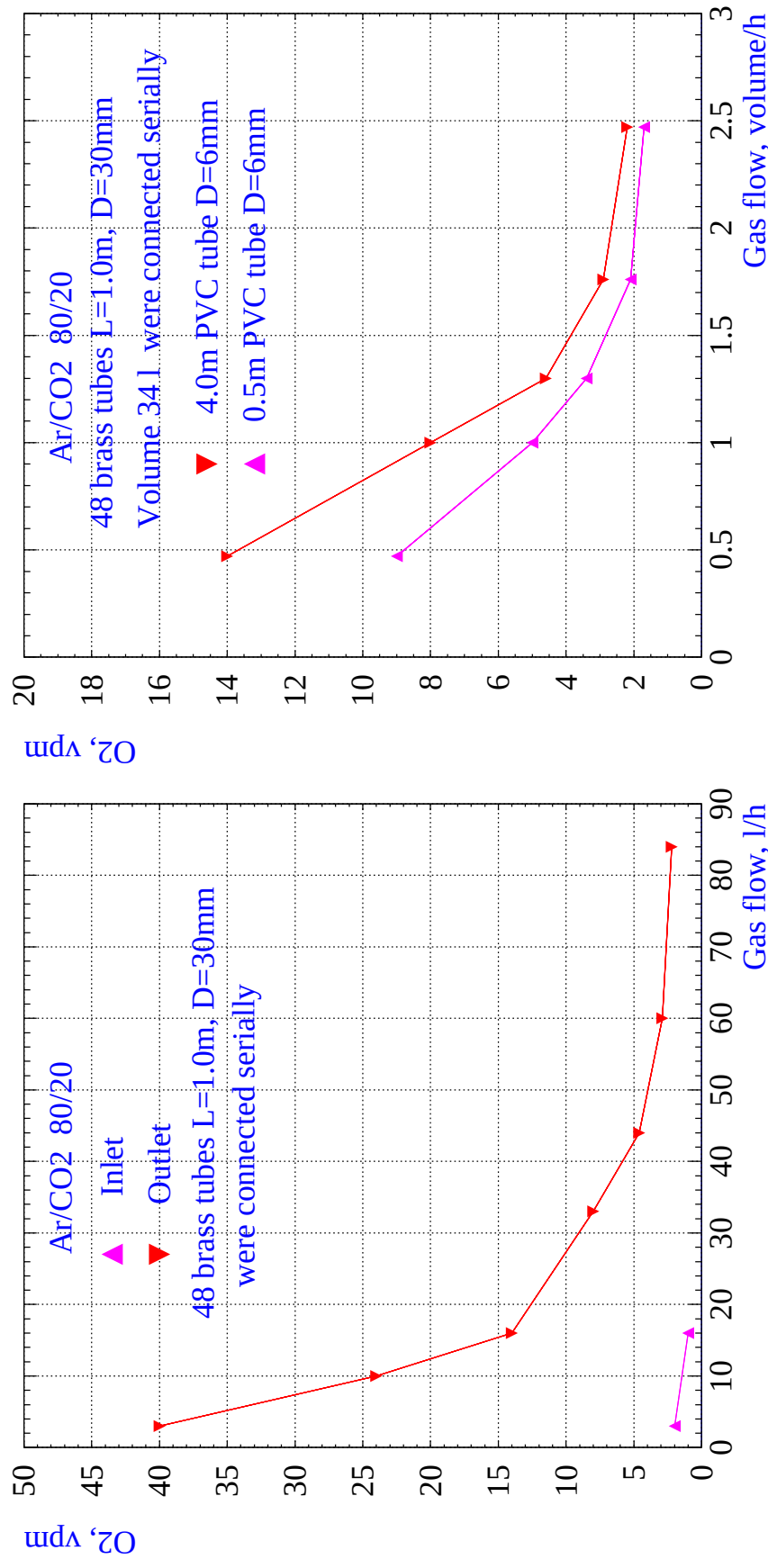


- 48 brass tubes, 30 mm inner diameter
- Ar+CO₂ (80% / 20%), PVC flexible tube
- ASD8 + Hera-B TDC

Oxygen



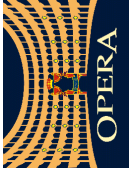
oxygen content in prototype (volume = 34 l)



● avoiding PVC tubes $\Rightarrow$ O₂ content decreased by 40 %

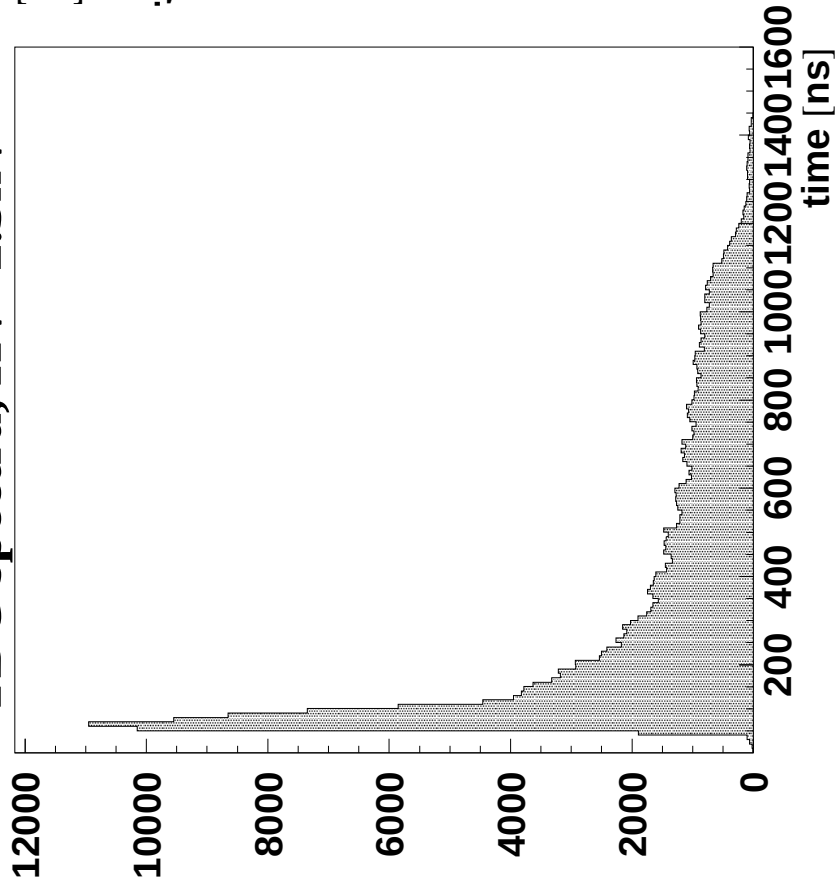
● outgasing tests for all used materials in gas room

resolution

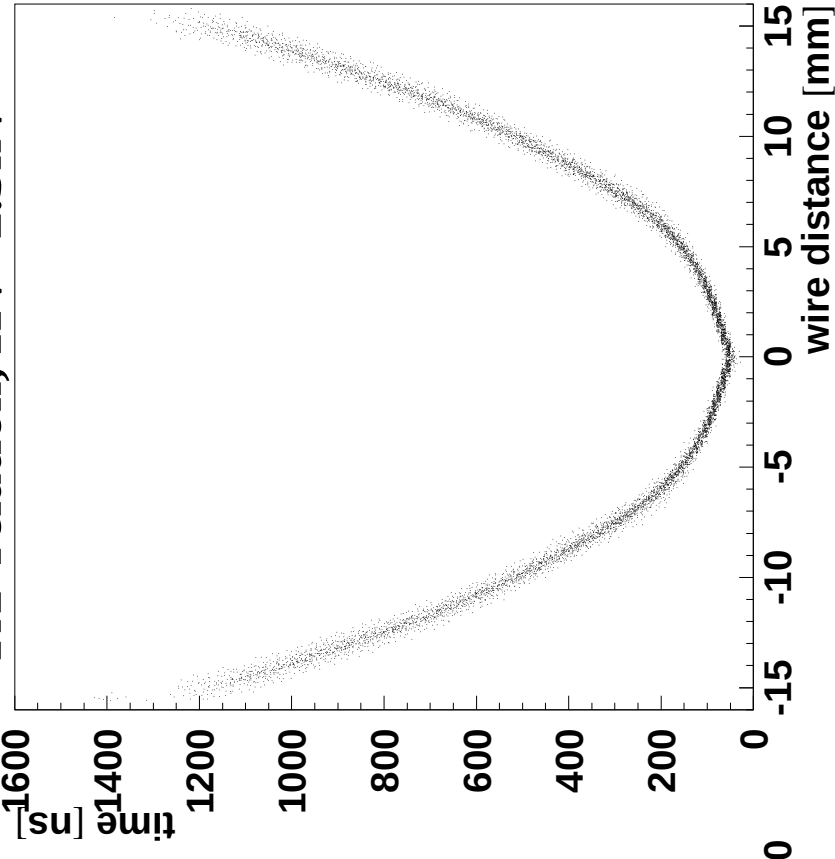


- simplified track reco used from ARGUS

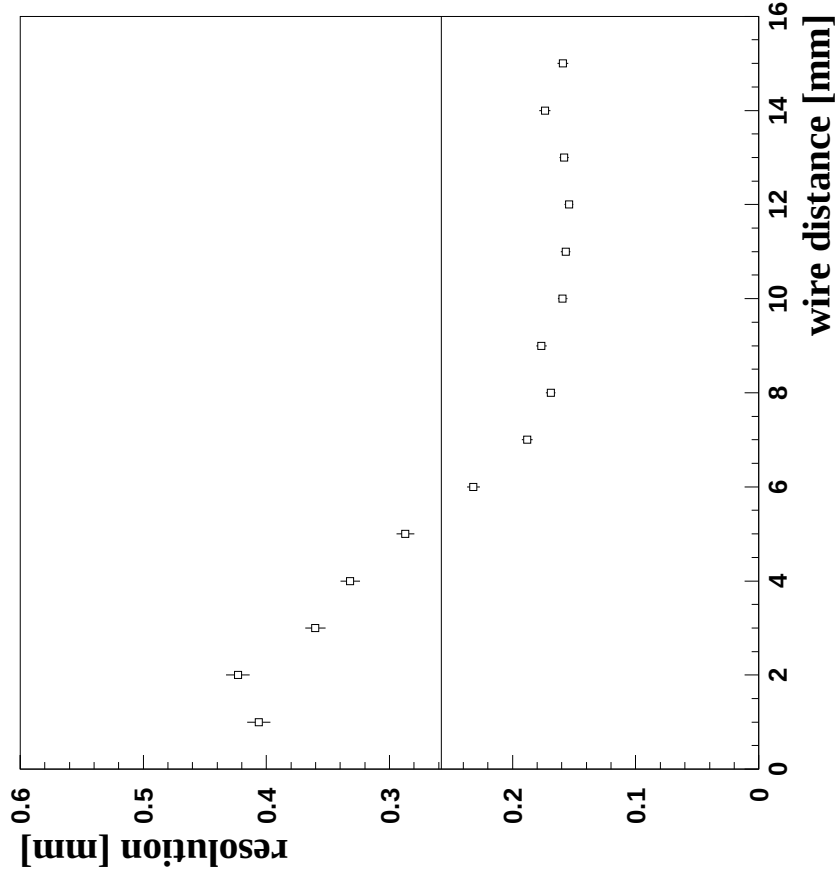
TDC spectra, HV=2.3kV



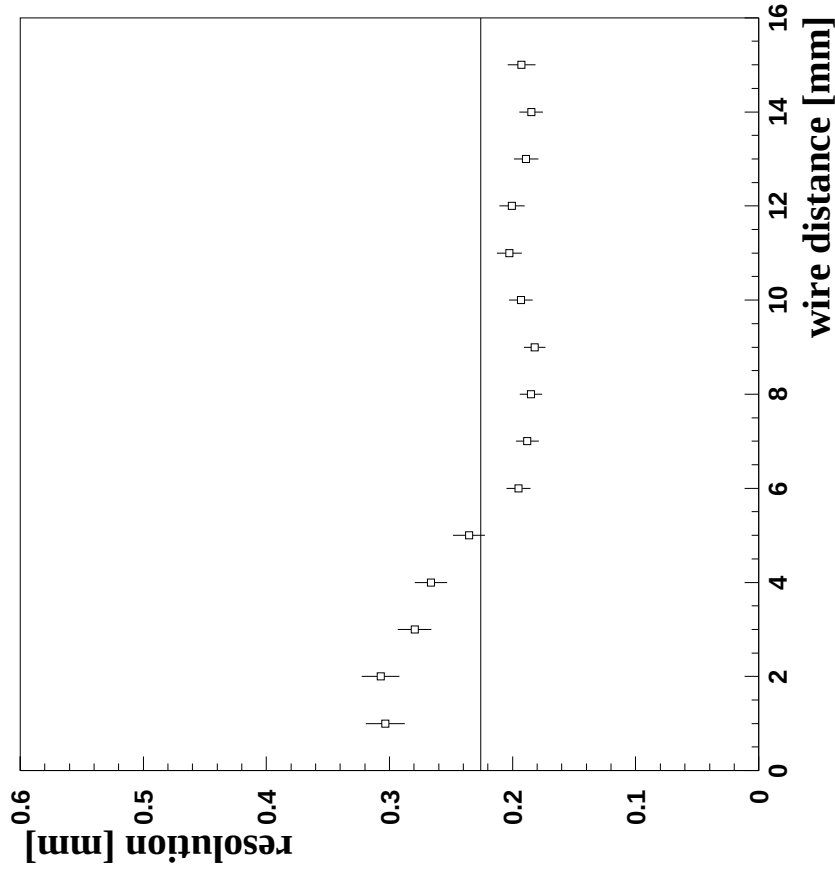
RT-relation, HV=2.3kV



Resolution function, HV=2.2kV



Resolution function, HV=2.6kV

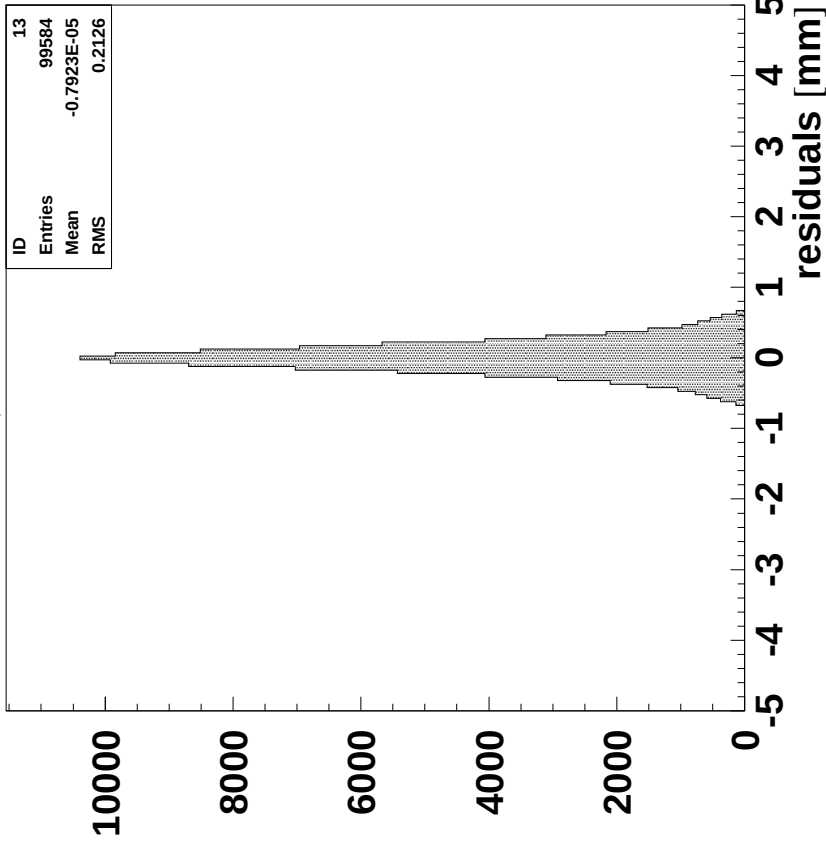


• high amount of $O_2 + H_2O \Rightarrow$ trigger on higher cluster number

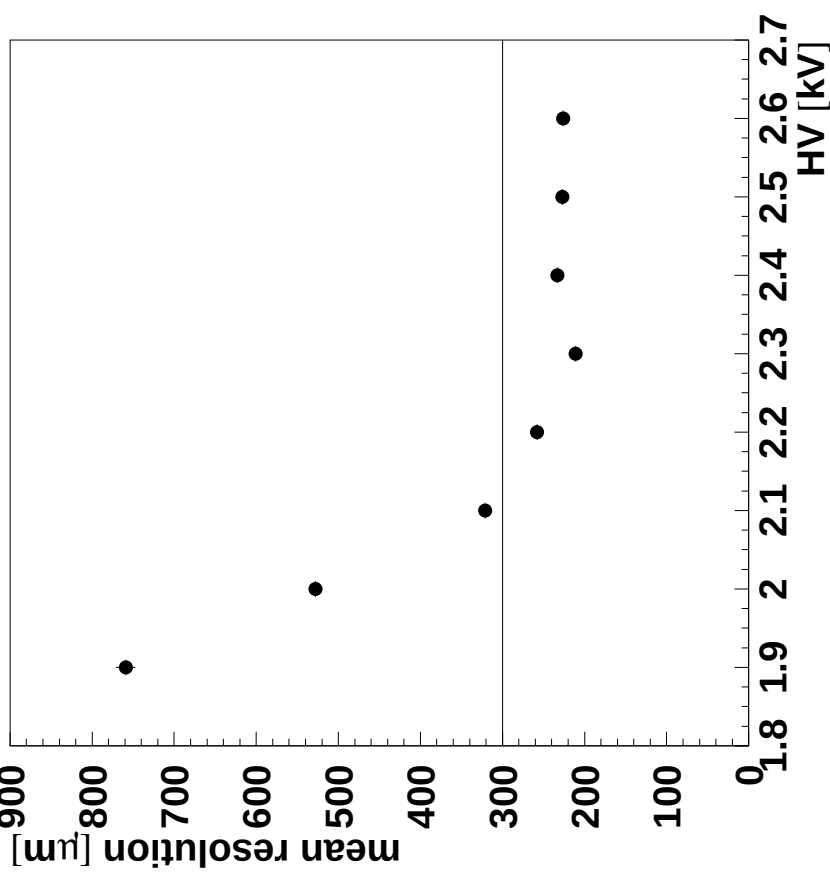
• new pipes $\Rightarrow$ better resolution (wire region)

• test with new electronic

residuals, HV=2.3kV



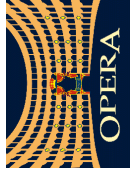
mean resolution vs. HV



● mean resolution < 300 μm (operation voltage)

⇒ goal reached in spite of contaminations

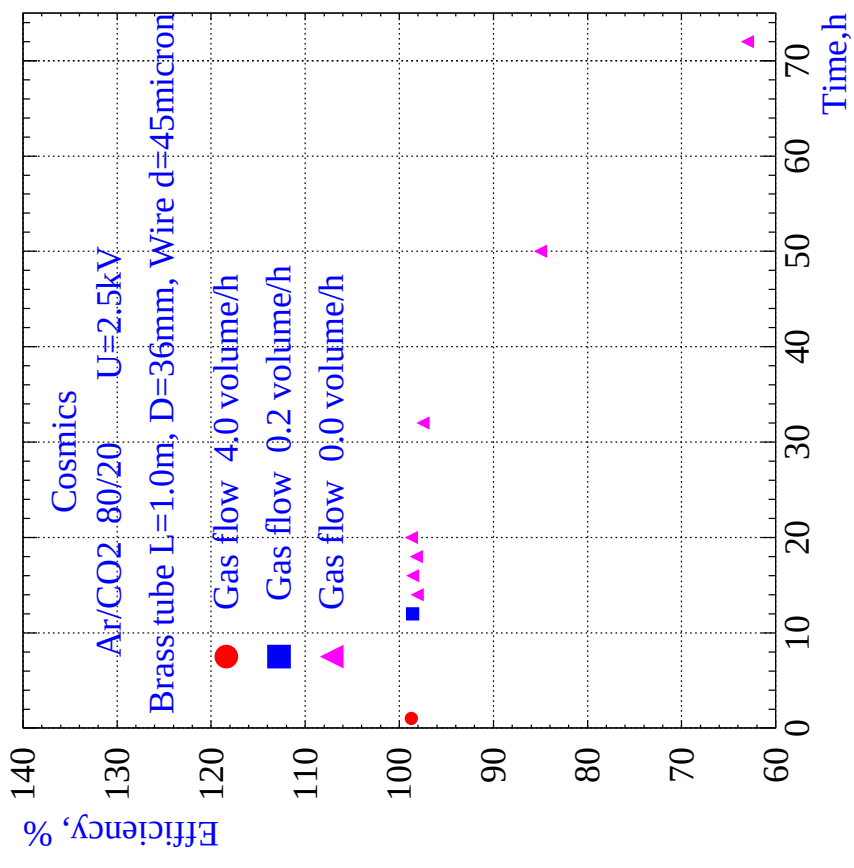
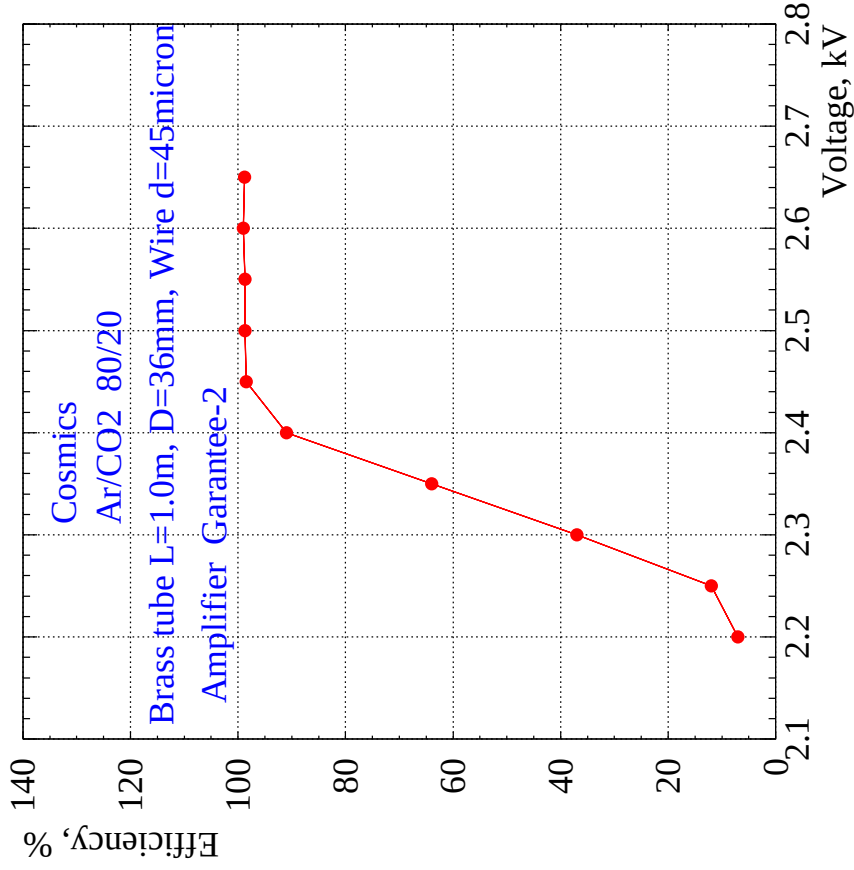
efficiency



- first efficiency studies done

Setup:





⇒ efficiency 98.5 %, rest loss due to showers (setup)

⇒ tube tight (no contaminations), efficiency drop after 15 h (at no flux)

status of real size prototype

- production of most parts done
- tubes + raw material for end plates and perforated sheets already delivered
- at the moment mounting table under design
 - ⇒ finished next month
- due to upgrade of the mechanical workshop
 - ⇒ production hall occupied
 - ⇒ using mounting space at DESY (mid of Dec./begin of January)

clean room of HERA-B:

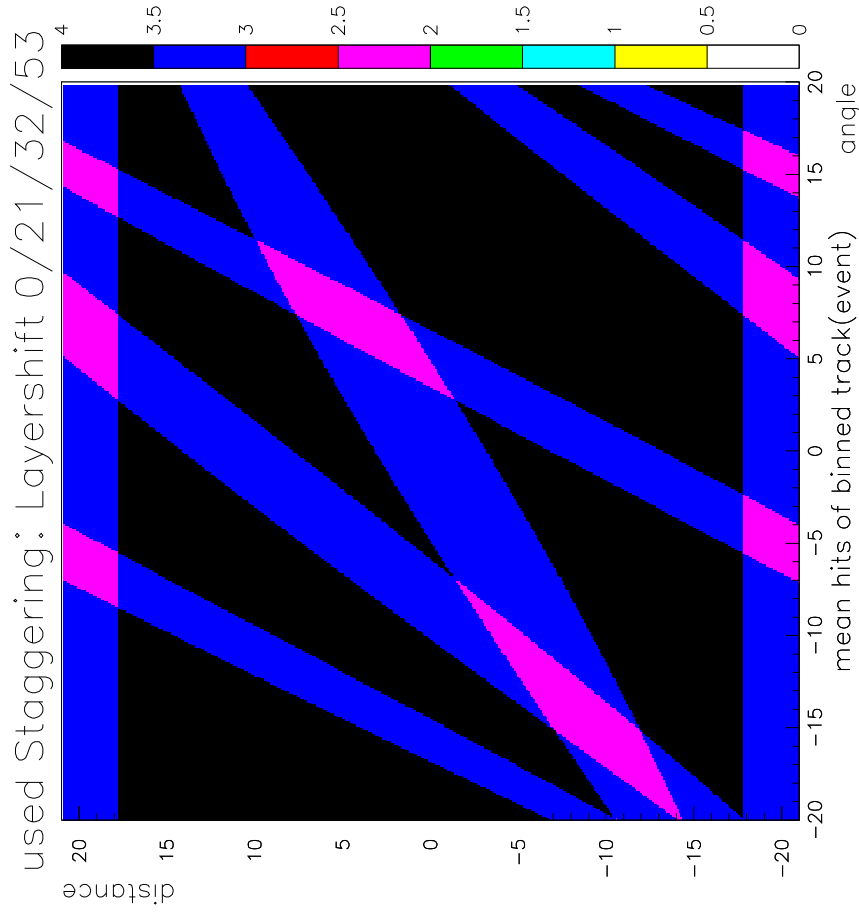


- mounting of prototype will start in January

design status

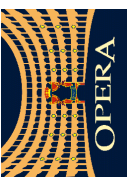


- design (3d) finished (small parts were changed)
- using optimal staggering:



hits/track	# of tracks [%]
0	-
1	-
2	7.3
3	44.1
>3	48.6

Summary



- to unfreeze the money $\Rightarrow$ MOU
- want to use amp L3 + discr. MAX963, first tests fulfills our requirements
- TDC chip design finished, engineering samples under test
- oxygen content in small prototype reasonable $\Rightarrow$ tightness
- efficiency (Guarantee-2) measured to 98.5%
- spatial resolution down to 200 μm (but high O_2 / H_2O content)
- mounting of real size prototype in January
- design finished