JRA3
Institute of Physics ASCR Prague

1. ECAL, VFCAL (V. Vrba)
2. HCAL (J. Cvach)
3. Exchange in NA2 (travels 8.5 k€)


FYZIKÁLNÍ ÚSTAV
Akademie věd České republiky
1999
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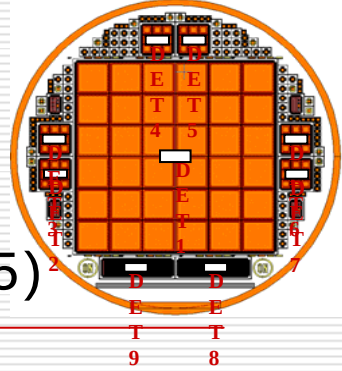
Tasks in EUDET & budget w/o overheads

- Si sensor development for ECAL, VFCAL
- Monitoring system for HCAL
- Consumables - 81.7 k€
  - Si sensor development + production (34.6 k€)
  - VME test stand (20 k€), calibration electronics (22.2 k€)
  - computing (4.9 k€)
- Personnel - 13 k€ for PhD students
- Travels 4 k€
- Contribution from the Institute
  - Permanent staff – 67 ppm
  - Travels (6.7 k€)

Si wafers from Prague

(G. Geyckin, ECFA workshop, Vienna, November 2005)

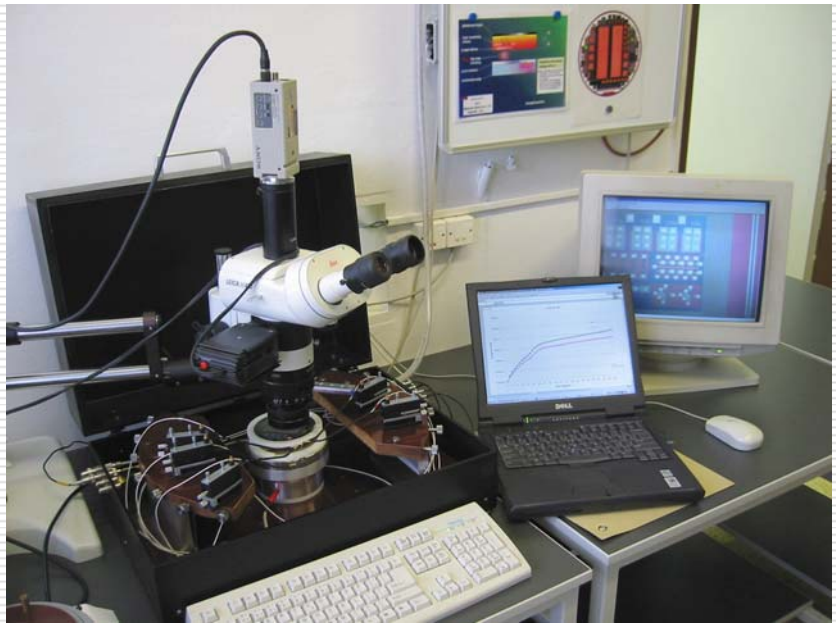


- Wafers are of excellent quality.

  Very low leakage currents before gluing

- Gluing procedure attacks passivation.

  Leakage currents increase by orders of magnitude after gluing, breakdown voltage drops



Problem was not solved by chemical surface treatment or different gluing protocols (time, temperature). Under investigation!

Si wafers from Prague – cont.

10 newly processed wafers (ON semiconductors, Rožnov)

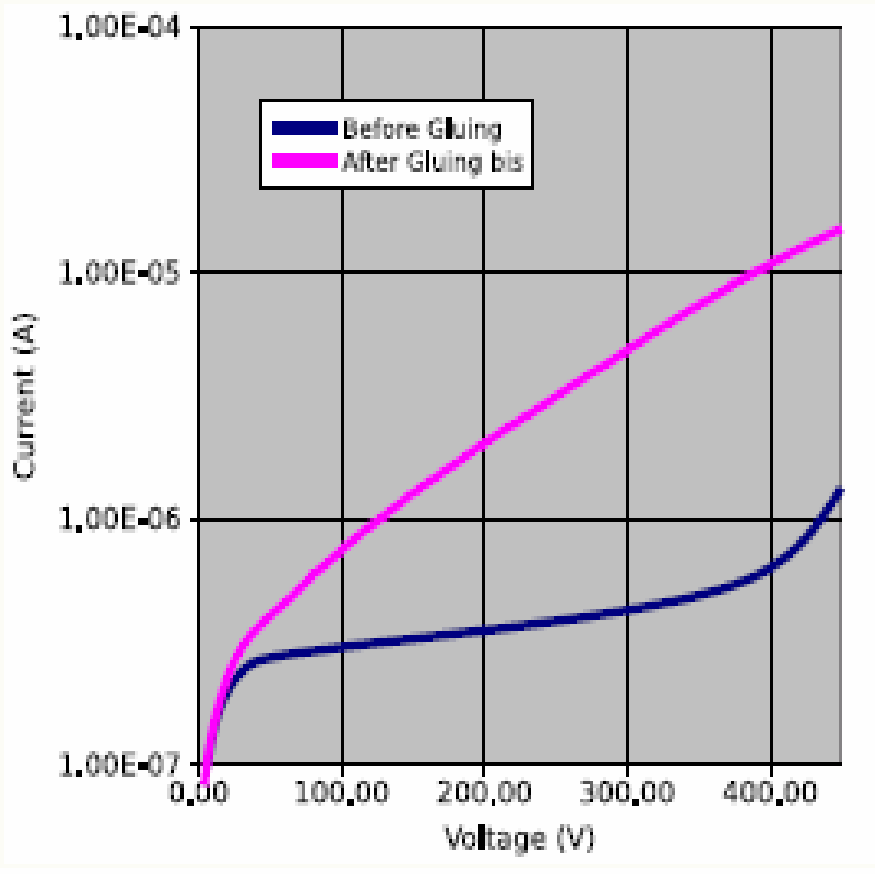
before gluing:

- low leakage current
- stable breakdown voltage

after gluing:

- leakage current ×10
- but breakdown voltage stable

Recently, manufacturer tries to minimize damages from assembly and delivers sensors for prototypes.

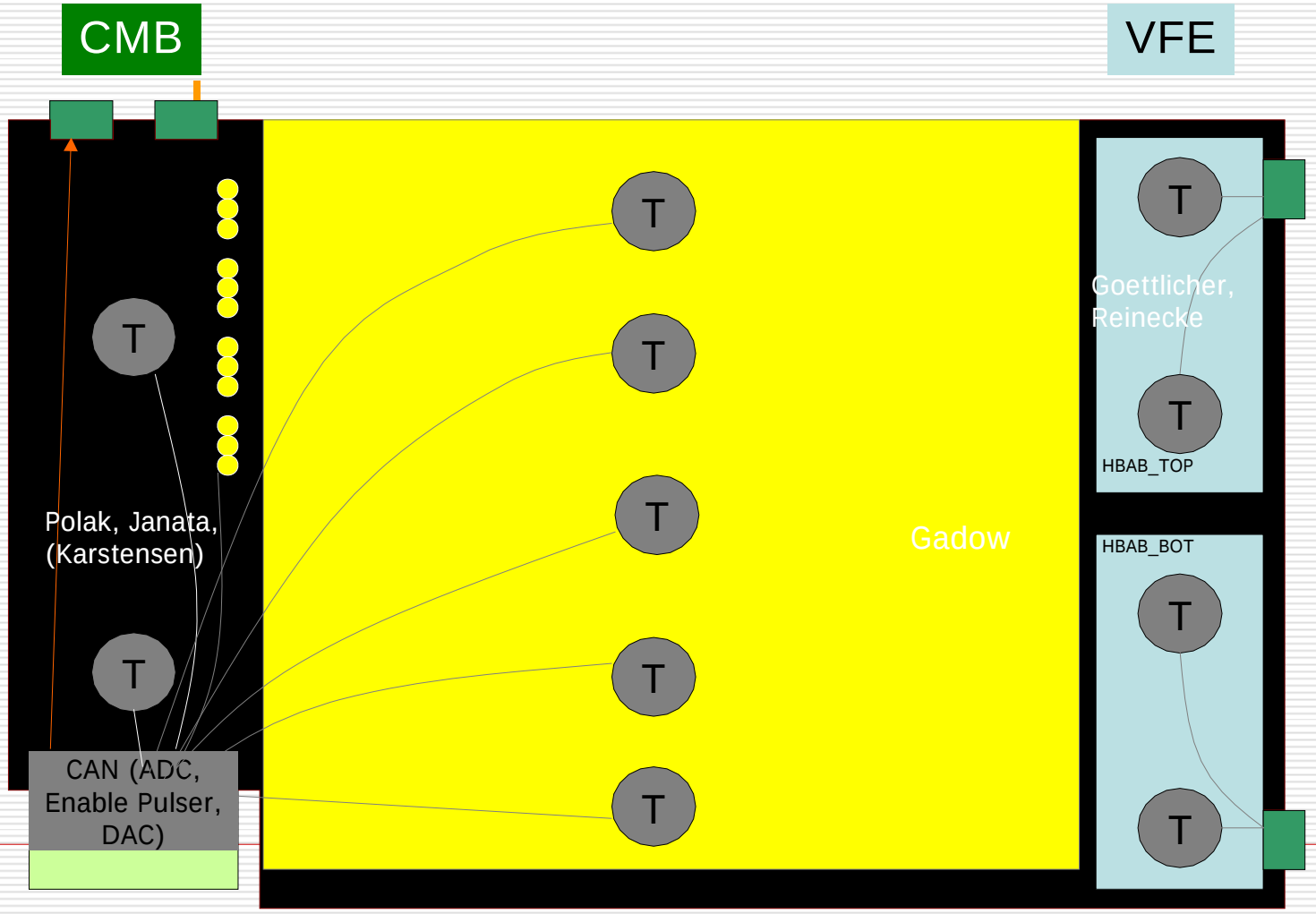


HCAL - Calibration + Monitoring Board system (I. Polák in Vienna)

CMB is provides

- calibrated UV flashes to the scintillator tiles
- optical feedback via PIN photodiode
- sensing of temperature at scintillator planes and CMB
- connection via CANbus to the detector Slow Control
- setting enable, amplitude, pulse width of each LED
- monitoring of temperature, voltages, ...

HCAL plane


CMB
VFE
T
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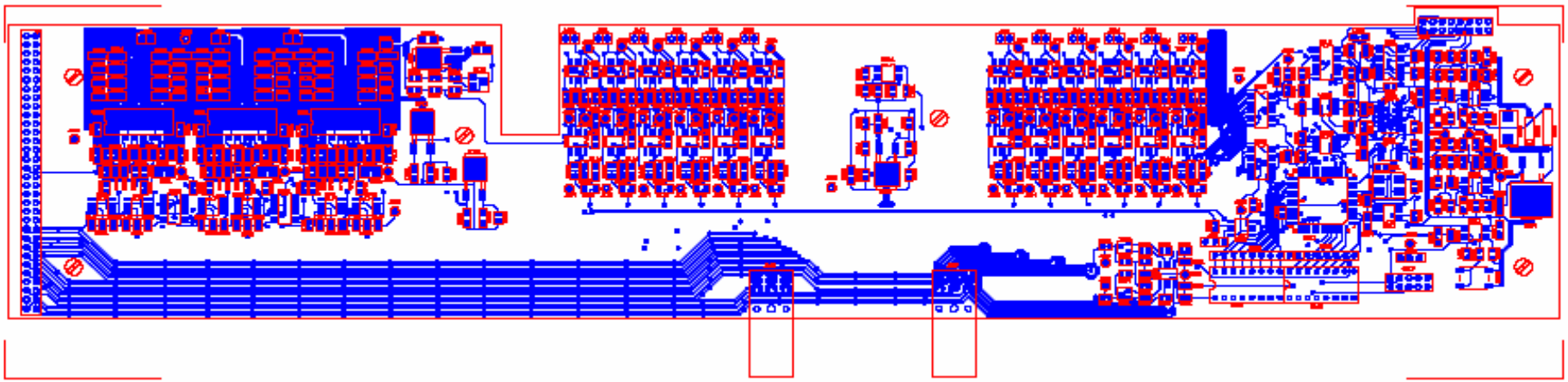
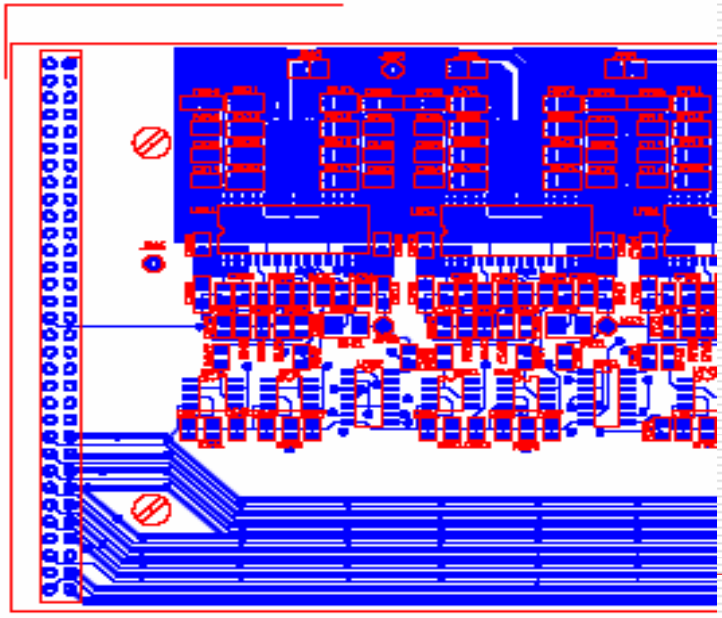
T
Goettlicher,
Reinecke
HBAB_TOP
HBAB_BOT
Polak, Janata,
(Karstensen)
Gadow
CAN (ADC,
Enable Pulser,
DAC)

Lower part of CMB – PCB





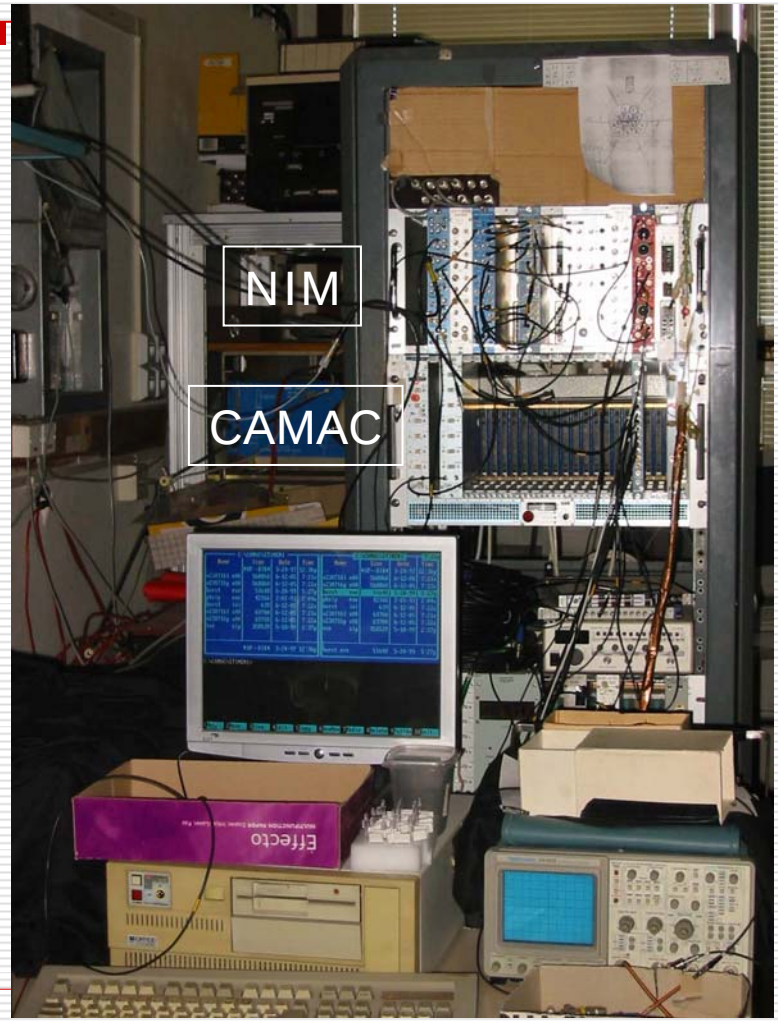
LED driver motive zoomed

- 4-layer board 1.6mm thick

- size 480 x 80 mm

Test stand

- The stand in the scintillator lab is a combination of CAMAC and NIM modules
- Equipment is 8-20 years old
- We applied in institute to finance in the next year
  - 10 VME modules + crate
  - A scope TDS 3054B
- The stand will be depreciated in 3 years by amount of 20 k€ from EUDET



What we intend to do in EUDET (2)

- ECAL – to solve technical problems with assembly and deliver sensors for prototypes
- VFCAL – using the solutions with sensors for ECAL deliver Si sensors for prototype:
  - 1 tower = 20 wafers
- HCAL – calibration electronics
  - 2006: 40 (double)boards
  - Later: new prototype version for simplified light distribution over the plane
  - We expect new prototypes being developed every 2nd year and produced the following year

Resources EUDET & others

- Main contribution from EUDET - consumables
- Upper table – our spending profile for consumables in EUDET

EUDET

year	HCAL	ECAL	VFCAL
2006	12 k€	6 k€	2 k€
2007	12	6	5
2008	14	7	5
2009	6,55	1,9	4,15
2010	0	0	0

- Lower table – funding needs given to WWS panel of LC - R&D program on HCAL
- Similar table will be done also for ECAL, VFCAL
- EUDET funding is important but minor source of total needs

$HCAL_{total}$ - WWS

year	Equipm	Travels	FTE
2006	35 k€	25 k€	2,5
2007	25	35	3,0
2008	35	25	3,0
2009	20	35	3,0
2010	30	30	3,0