

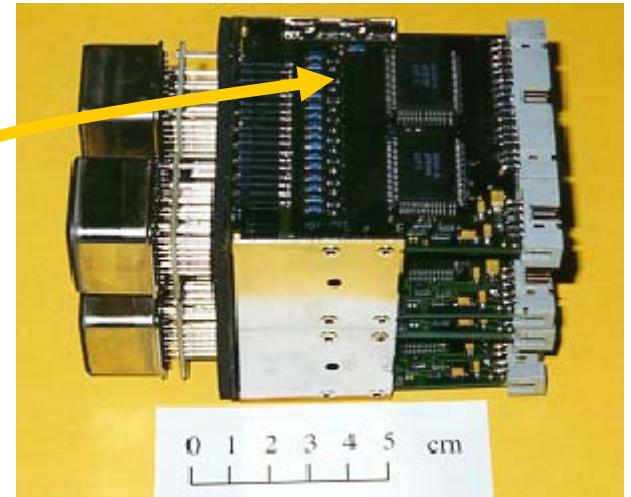
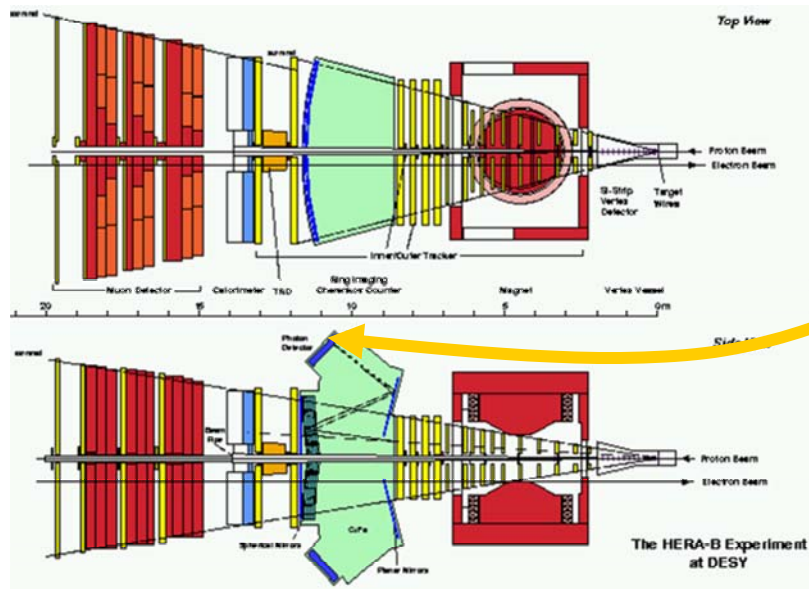


Activities at Univ. Barcelona

Ll. Garrido

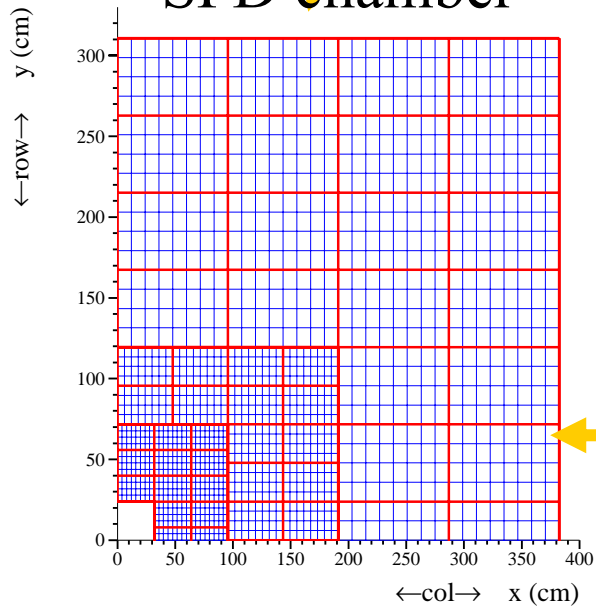
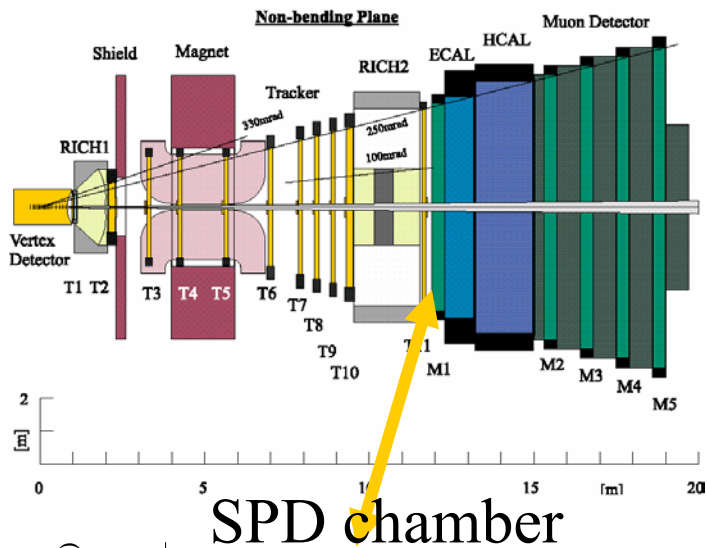
Barcelona, 29 April 03

- Starting: 96
in collaboration with IFAE we join the HERA-B experiment
 - Main activity: RICH
- On 98
we join the LHCb collaboration
 - Main activity: The SPD chamber of the calorimeters

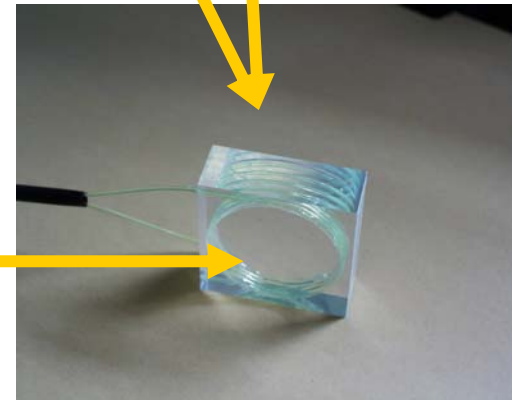
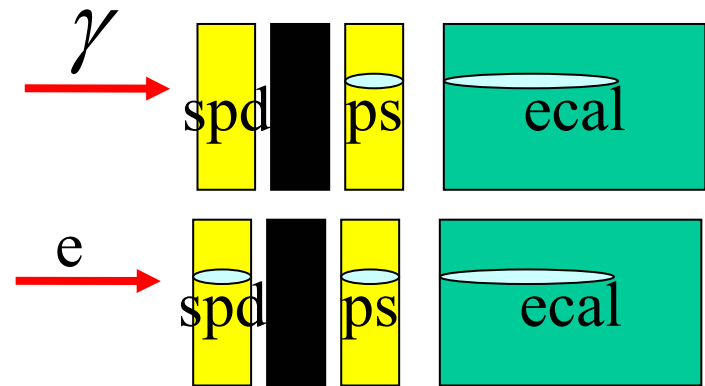


- test of the ASD8 electronics (start of the electronics lab.)
- maintenance and operation of the RICH
- reconstruction program (PID)
- data analysis (3 Ph.D.)

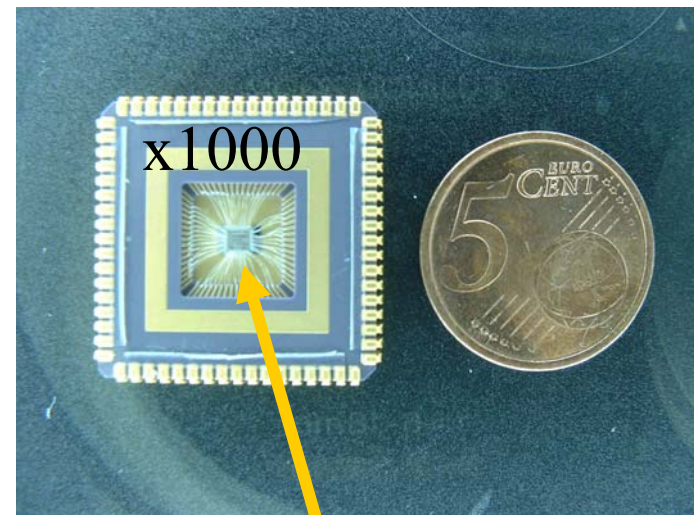
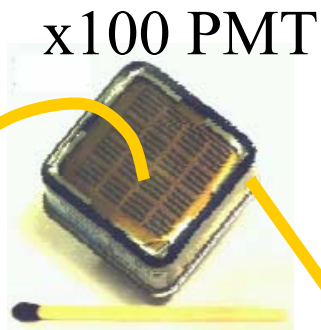
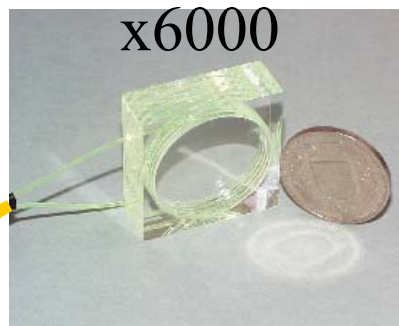
No additional effort on this experiment any longer



Discriminate neutral/charged
at level-0 trigger

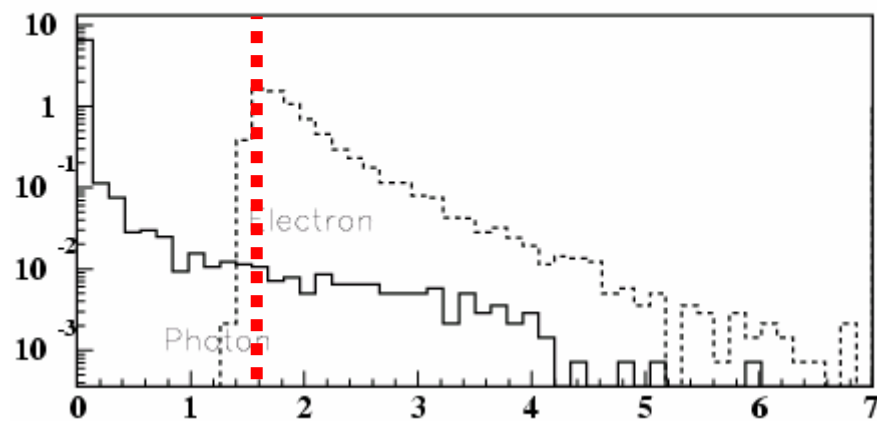




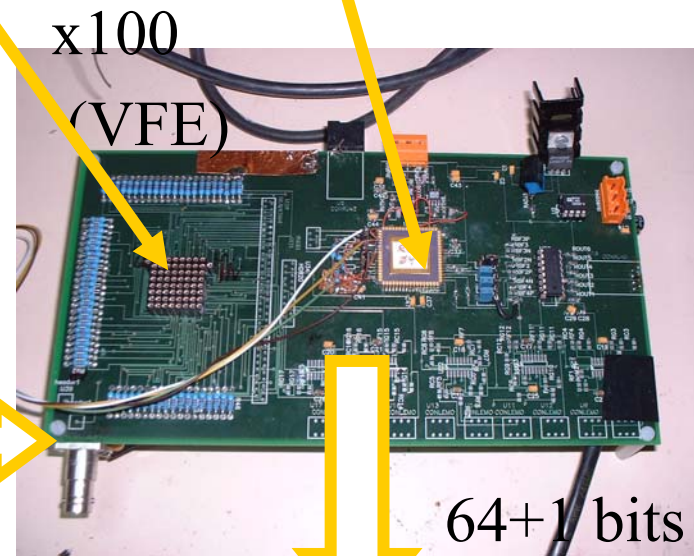


64 fibers

Monte Carlo : SPD Deposited Energy (MeV)



8 Channels as



Control LHCb

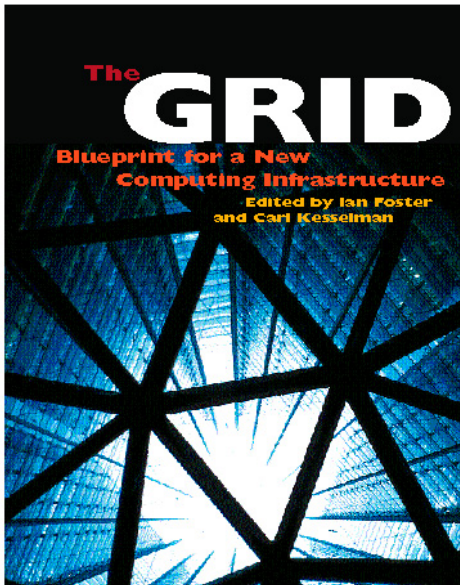


x5
Control boards



64+1 bits trigger

- Farm with 20 PC's
- LHCb MC generation



IP: Ricardo Graciani

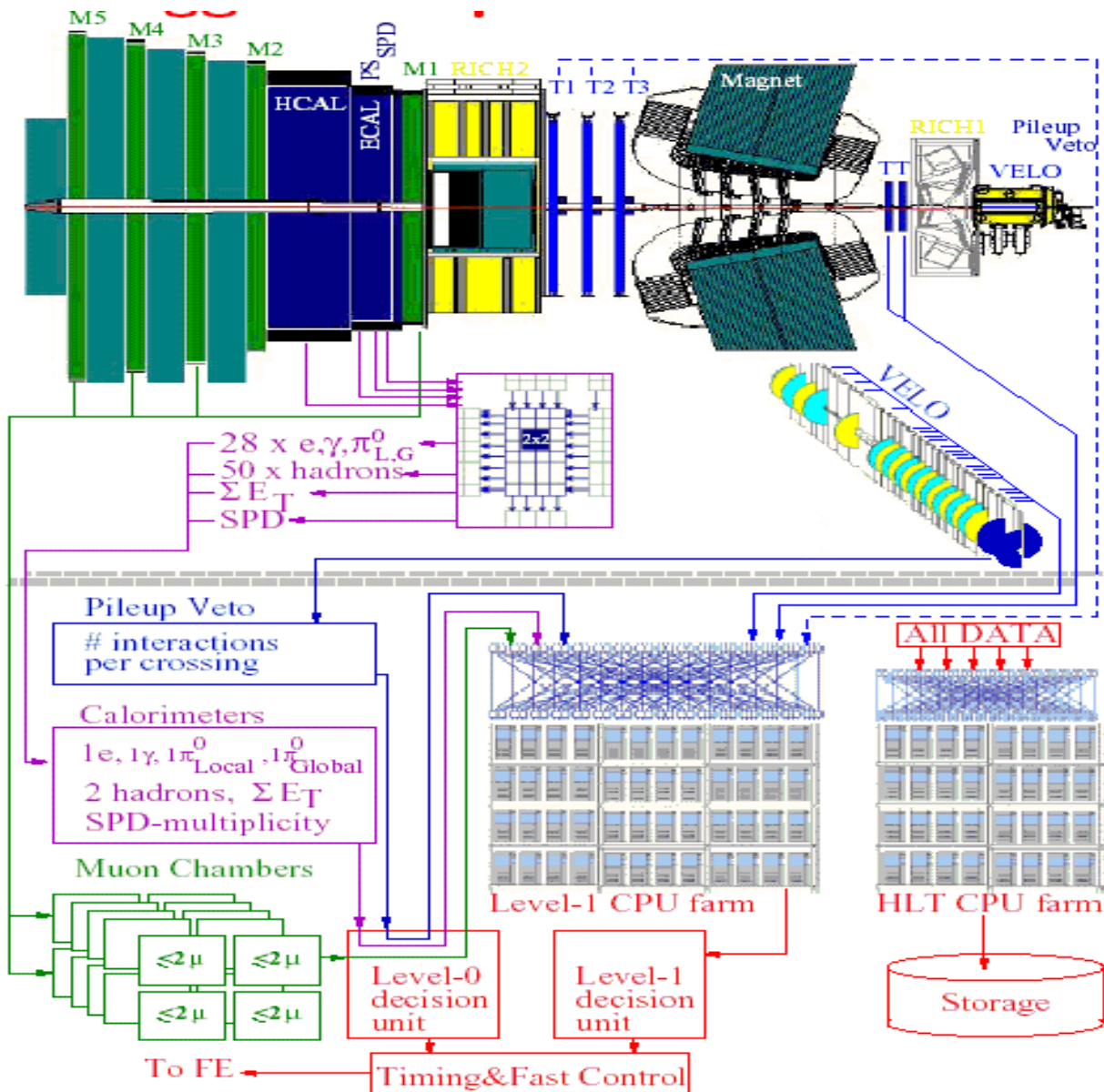
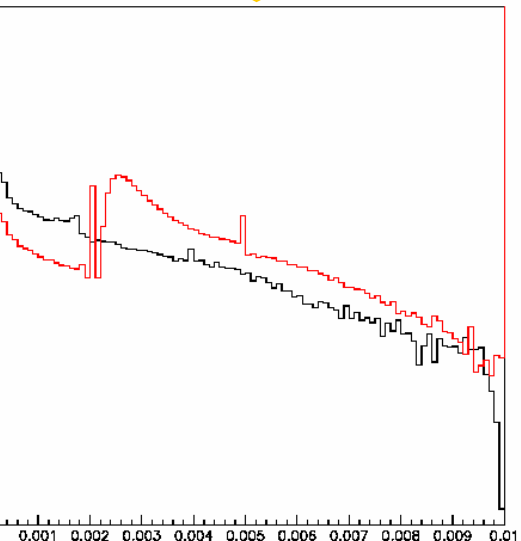
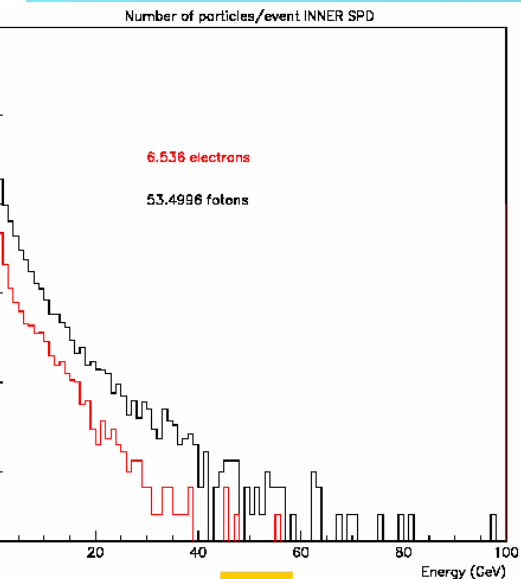
Very important collaboration from the electronics department of our faculty of physics and from the University Ramon Lull

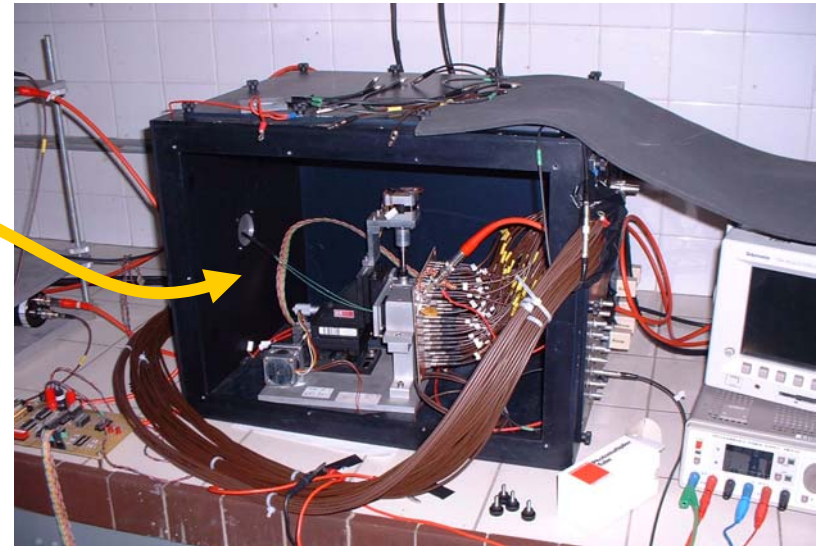
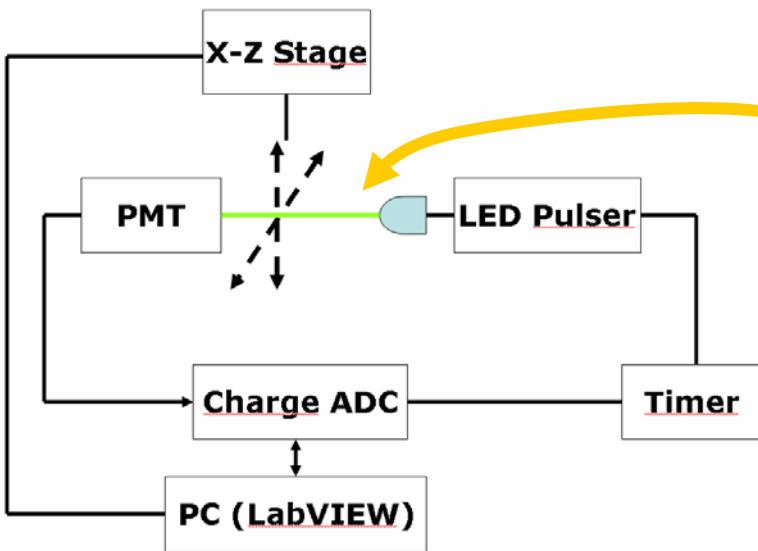
People

<u>ECM (UB)</u>	<u>Elect. (UB)</u>	<u>Elect. (URL)</u>
R. Graciani	S. Bota	X. Vilasis
D. Gascon	A. Dieguez	J.Riera
E. Aguilo	A. Herms	M. Rosello
M. Calvo	X. Cano	S.Luengo
S. Gomez (URV)		R. Ballabriga
E. Grauges		X. Xirgu
E. Benedico		O.Motto
LI. G.		

- ASIC + Digital Control : UB
- VFE and Control boards : URL
- PMT : UB + URL
- PHYSICS : UB

The role of the SPD at the Level-0 trigger



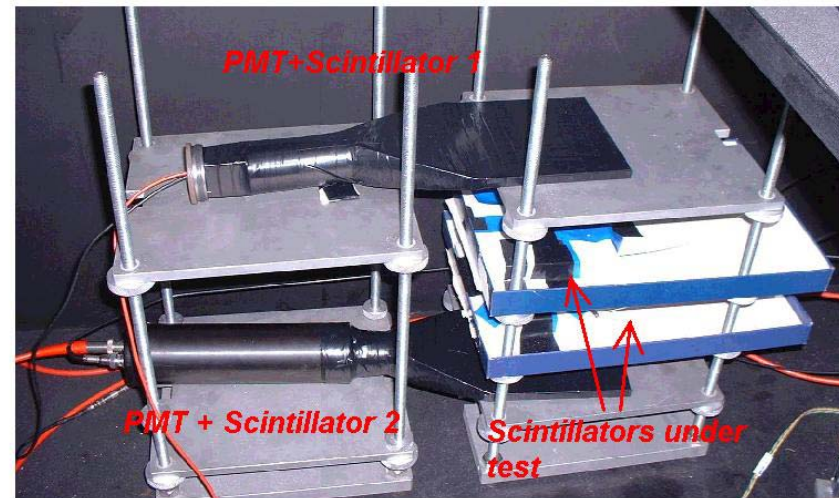


Test

- Absolute gain of all channels
- Linearity test
- Short term stability
- Dark current

Test on reduced numbers:

- Quantum efficiency
- Optical Crosstalk
- Long term stability
- Temperature and magnetic field dependence

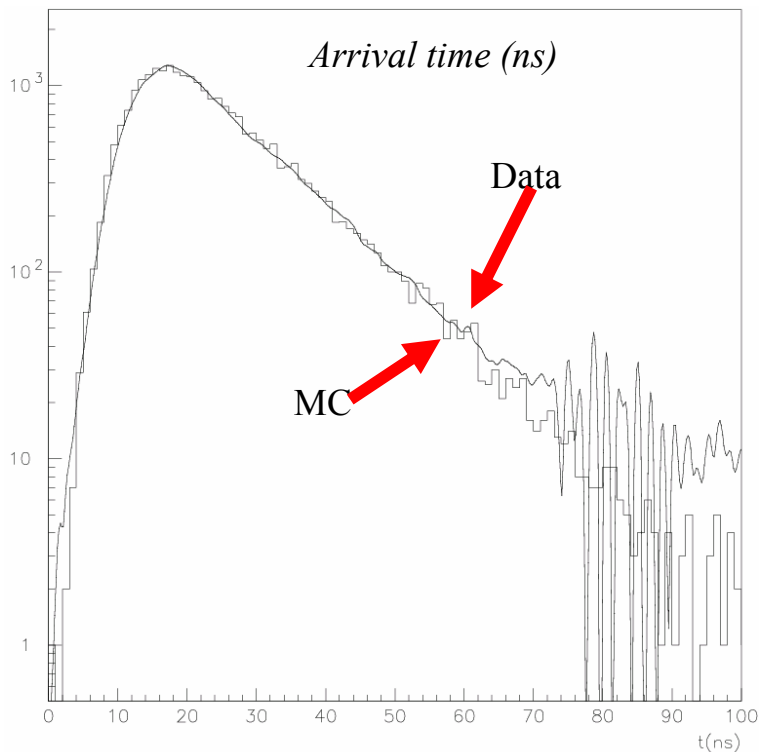


Simulations

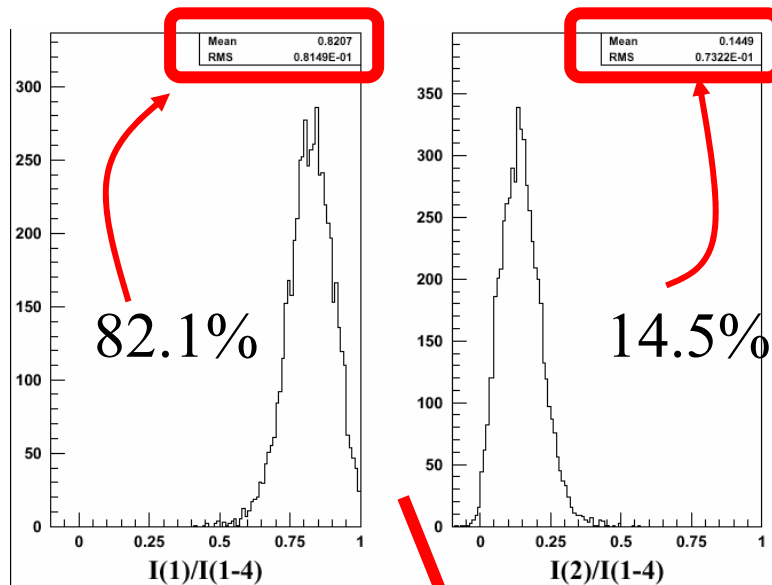
•Simulation of PAD's photons arrival time distribution at the PMT and its inclusion in the LHCb detector simulation, and its comparison with **cosmic ray test**:

Parameters:

- Scintillator decay time: 2.1 ns
- Scintillator mean free path: 0.4 m
- WLS decay time: 11.5 ns (Y11)
- WLS mean free path: 8m
- White fiber m.f.p: 30m
- In-out going angle: 26.7°

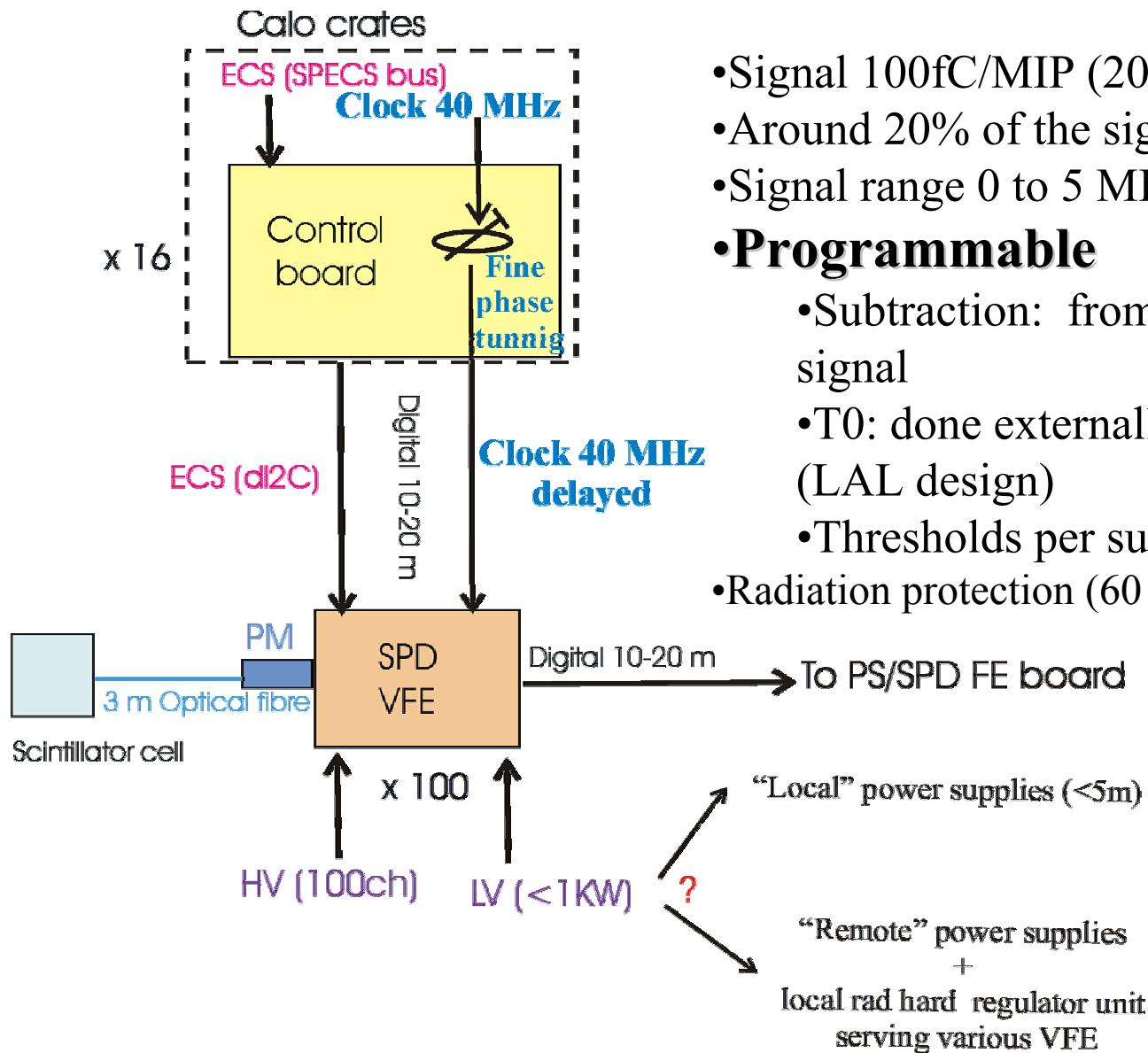


Normalized signal (25ns windows)



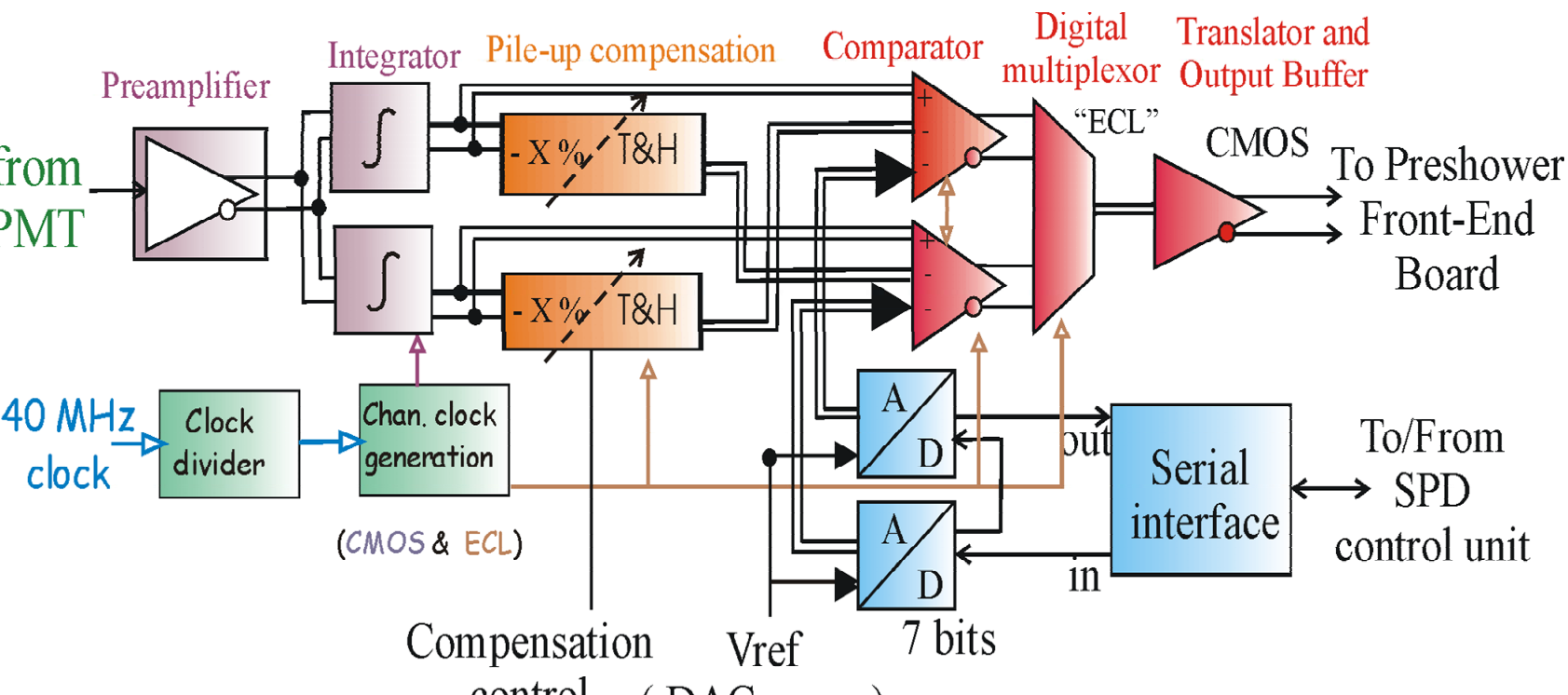
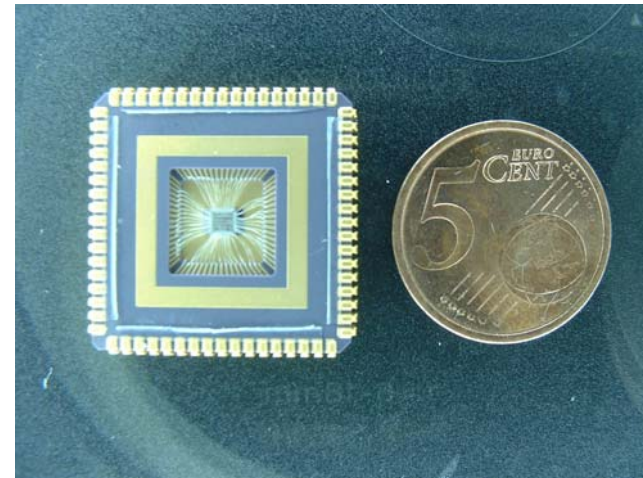
Fraction of energy	Cosmic ray test	Simulation
I(1)/I(1-4)	82.1 %	82.0%
I(2)/I(1-4)	14.5%	16.1%
I(3)/I(1-4)	2.4%	1.9%

Function of the cell size



- Signal 100fC/MIP (20-30 pe/MIP)
- Around 20% of the signal on the next 25ns
- Signal range 0 to 5 MIP
- **Programmable**
 - Subtraction: from 0% up to 40% of the signal
 - T0: done externally with a delay unit (LAL design)
 - Thresholds per sub-channel
- Radiation protection (60 Gy on 10 years)

- 0.8 μm AMS BiCMOS Technology
- Dual channel
- Fully differential
- SEU and SEL protection
 - Triple voting
 - Guard rings



Status of the electronics

ASIC:

RUN 4 (June 2002)

- Complete processing channel
- separate blocs + digital ctrl
- Works at 3.3 V to reduce power consumption
- Higher gain to meet PMT DC current limit requirements.

RUN 5 (July 2003)

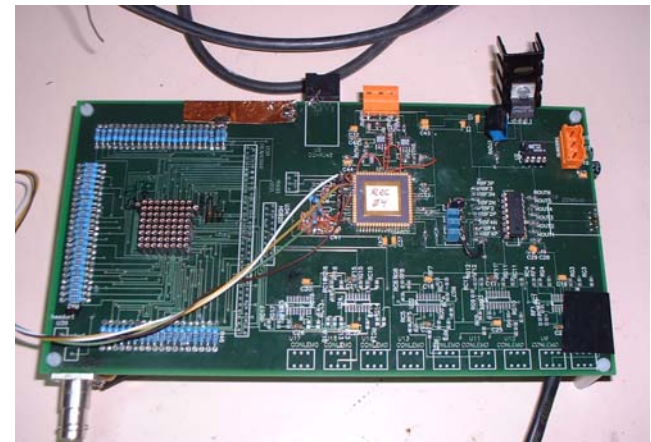
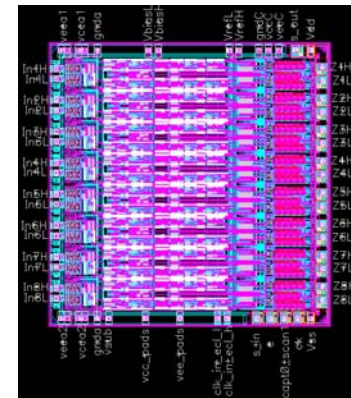
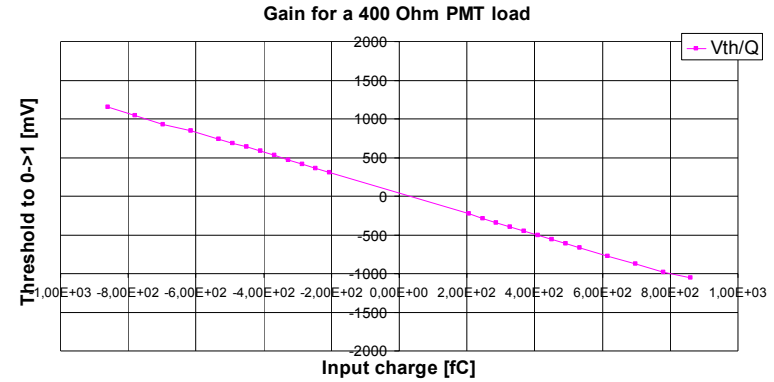
- 8 full channels
- Final design Prototype

VFE

- Prototypes working (1-4 channels)
- End this year: 16 full channel (2 ASIC) and digital control (6-layer board)

Control Board

- Under design (1 Control Boards every 4 VFE Boards)



Towards the massive ASIC, boards and PMT test

