

DEPFET TB 2010

**5th DEPFET workshop
– IFIC Valencia, Sep 30th 2010 -**

Marcel Vos, IFIC Valencia

SPS Operation

Period 6 2010 Oct 21 to Nov 22

Schedule Issue date: 15-April-2010

Version 2.0

(colour code: purple (dark) – scheduling meeting, light green (light) – weekend or holiday)

		Thu 21	Fri 22	Sat 23	Sun 24	Mon 25	Tue 26	Wed 27	Thu 28	Fri 29	Sat 30	Sun 31	Mon 1	Tue 2	Wed 3	Thu 4	Fri 5	Sat 6	Sun 7	Mon 8	Tue 9	Wed 10	Thu 11	Fri 12	Sat 13	Sun 14	Mon 15	Tue 16	Wed 17	Thu 18	Fri 19	Sat 20	Sun 21	Mon 22	
Machine		816 WED MD																																	
NORTH AREA	T2 -H2	8h NA61 Z Fodor phys		8h A Malinin		CREAM H2B		8h NA61 Z Fodor test		8h P Luukka		CMS-SiBT		8h L Tkachev		NUCLEON																			
	T2 -H4			8h M Alfonsi		RD51		8h ALICE-VHMPID A di Mauro		8h ALICE-SPD A di Mauro		8h CMS-ECAL A Singovski																							
	T4 -H6	8h CMOSILC APX1		8h Wilkens		MMEGAS AIBL H6A/B		8h SavoyNavarro		SiL RD H6B		8h M Vos		DEPFET H6B																					
	T4 -H8	8h ATLAS-3DSI		8h H Wilkens		ATLAS-STGC		8h H Wilkens		ATLAS-MDTROM H8B																									
	T4 -P0																																		
	T6 -M2	8h G Mallot		COMPASS muons																															
	-CNGS	8h Neutrinos		CNGS																															
For further information contact the SPS/PS-Coordinator																																			
Remarks		SPS/PS-Coordinator: Horst Breuker E-mail: SPS.Coordinator@cern.ch phone: 73777 (ext. +41 22 767 3777) mobile: 164212 (ext. +41 76 487 4212) - No further remarks																																	

TB2010, our beam period: 15-21 November
 Last slot of the season, after SiLC (parasitic operation possible)
 EUDET telescope requested



TB period clashes with B2GM

Some people have already indicated they are not available

TB period clashes with PXD6 testing

Assume some people are needed elsewhere

Required:

(EU) DAQ: **Sergey** & Julia (Bonn), Jochen (Hei) + ?

DUT operation: **Jochen (Hei)**

Characterization (at MPI): **Jelena**, Christian K. (MPI) + ?

Analysis team: **Benjamin S.** (Gö) + Guillermo (Val) + ?

Mechanics: **Carlos (Val)**

Requested EU funding (EUDET) for travel and stay. Have to give names in two weeks

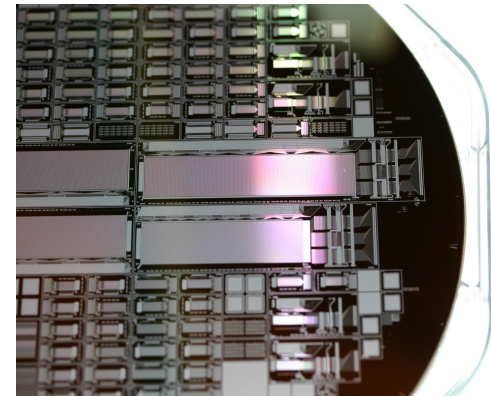
TB2010: DUT

- 1) S3B module based on PXD5 with 4 um gate length
- 2) DCDB-based PXD5 DUT (on hybrid 4.1)

- **(Nearly) full-speed read out**
row rate/nominal ~ 3 , compared to several orders of magnitude with previous system)
- **Relevant pedestals, common mode**
but custom power supplies, cables, etc.

3) Possibly PXD6 module

- **mm² device, ILC design**
affected by yield problem, but feasible
- **First thin DEPFET**



DCDB read-out scheme → feed-back from experts:

full speed out of the question after Jochen's presentation

Characterization of device → assign responsible groups:

Matrix optimization (gate, source voltage scan with laser, calibration with source)

DCDB calibration (needed to get g_q)

Focus of the program

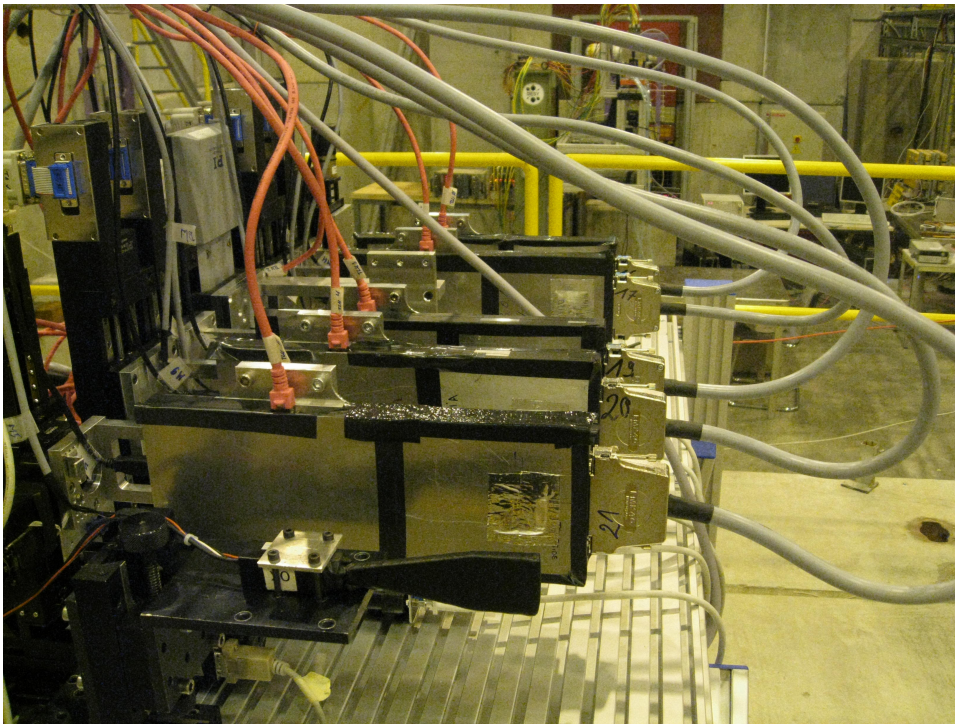
A “read-out” program varying DCDB parameters, if (1)

A “thin sensor” program with angle scans, if (2)

Be ready for either

TB2010: telescope

Telescope: use either EUDET (3-5 μm pointing precision) or S3B telescope used in 2009 (1 μm pointing precision)



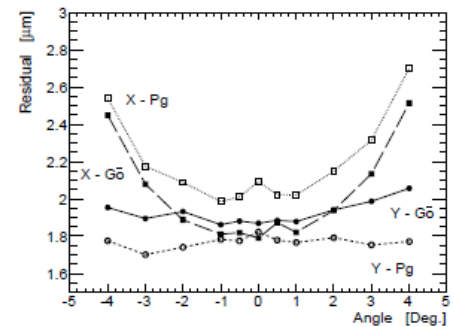
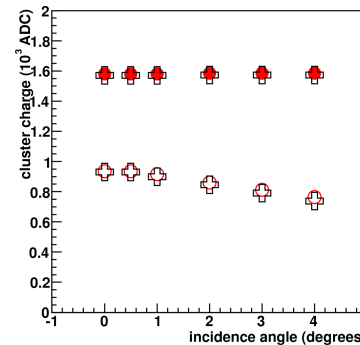
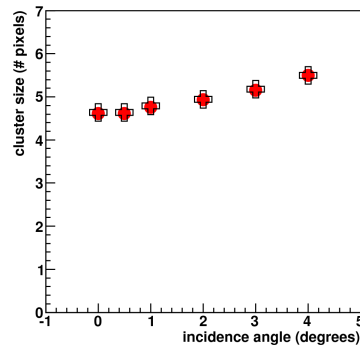
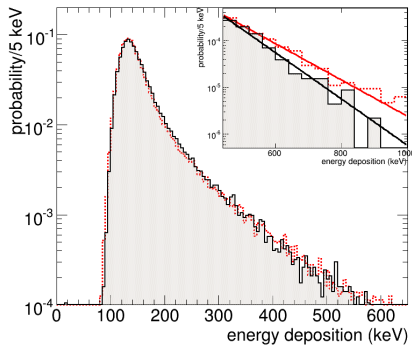
Choice entirely driven by desire to minimize our requirements on limited DEPFET resources (manpower, mostly)
Will have serious difficulties to characterize the resolution of PXD5 DEPFET devices
A TB always comes with the risk of encountering a problem that cannot be solved in time. With EUDET, it's not even in our hands to solve it.

TB2010: analysis

The analysis team present at the TB is responsible for validating the data (quasi-online monitoring), for documenting what happened and for preprocessing the data. Will be reinforced by people back from B2GM: expect serious effort from at least two experienced teams (Pr, Gö, Bonn) + some students (Val, ...)

My proposal: produce a few basic plots (S/N, g_q , resolution vs. angle, bias voltage) rapidly (~January/February) that can go into a brief publication by the DEPFET collaboration "Performance of (thin) DEPFET active pixel sensors (with fast read-out)". This is not a TB paper, but an announcement of a major step made by the collaboration as a whole, with some TB results

This does not exclude the possibility that a TB paper with a more involved analysis can be written at a later stage.



Beam requests typically due by Christmas
Remember: SPS may not be active in 2012.
Want to demonstrate performance of a Belle-II half-ladder with nominal read-out speed.
More than one period is a too large effort.

Proposal: one-week period early in the season... June/July.

Options we will have in case of ...

DCDB \ PXD6	On time	Late
YES	PXD6 ILC type matrix 24x24 μm^2 or 20x20 μm^2 & DCDB/DCDRO test system for ILC type matrix	PXD5 ILC type matrix 24x24 μm^2 or 20x20 μm^2 & DCDB/DCDRO test system for ILC type matrix
NO	PXD6 ILC type matrix 24x24 μm^2 or 20x20 μm^2 & S3B test system for ILC type matrix - modified -	PXD5 ILC type matrix 24x24 μm^2 or 20x20 μm^2 & test system for ILC type matrix

TB2009

year

Tentative title of TB paper

2008/2009

TB of the PXD5 production of DEPFET active pixel sensors
 Micron resolution device, Digitizer validation

Nov 2010

TB of (thin) DEPFET a.p.s. (with full speed read-out)
 Study realistic pedestals/common-mode

July 2011?

TB of Belle-II PXD prototypes
 Show this meets the requirements

