DEPFET TB 2010

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

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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

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
- **mm^2 device, ILC design**
    affected by yield problem, but feasible
- **First thin DEPFET**
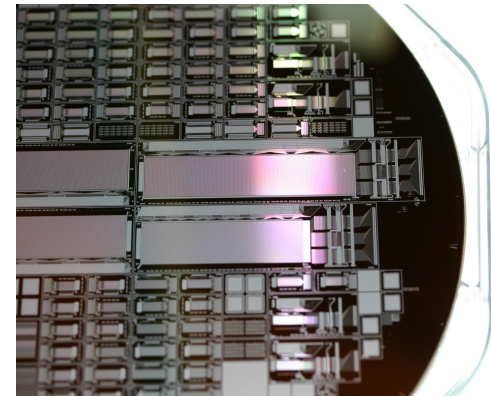
DCDB read-out scheme → feed-back from experts:
    full speed out of the question after Jochen's presentation
Characterization of device → assign responsible groups:
    Matrix optimization (gate, source voltage scan with laser, calibration with source)
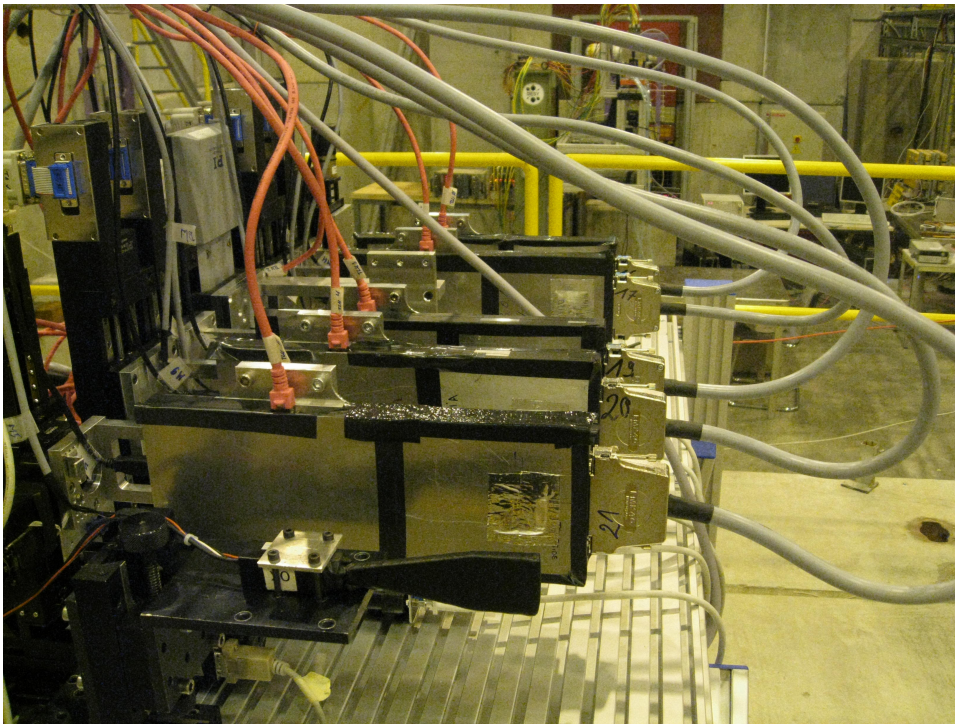   DCDB calibration (needed to get g_q)
Focus of the program
    A "read-out" program varying DCDB parameters, if (1)
    A "thin sensor" program with angle scans, if (2)
    Be ready for either

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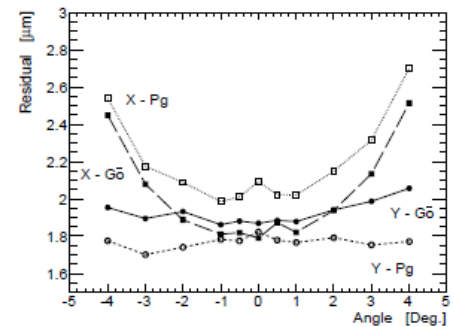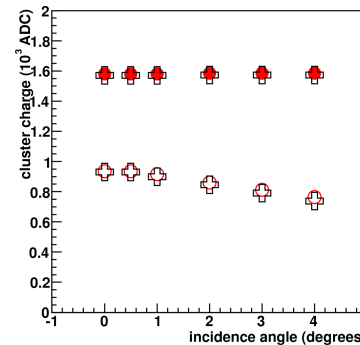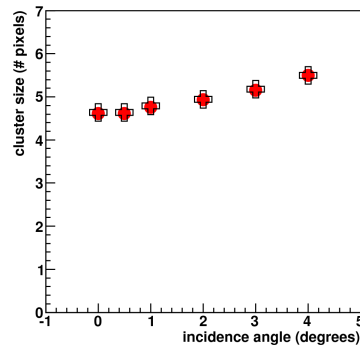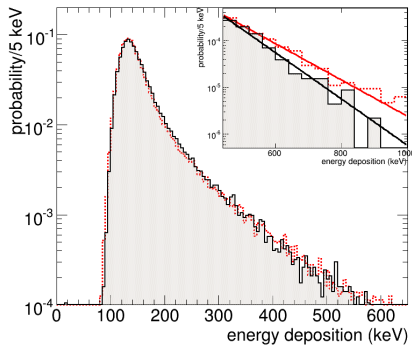
Beam requests typically due by Christmas
Remember: SPS may not be active in 2012.
Want to demonstrate performance of aBelle-II half-ladder with nominal read-out speed.
More than one period is a too large effort.

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 24x24µm² or 20x20µm² & **DCDB/DCDRO** test system for ILC type matrix	**PXD5** ILC type matrix 24x24µm² or 20x20µm² & **DCDB/DCDRO** test system for ILC type matrix
NO	**PXD6** ILC type matrix 24x24µm² or 20x20µm² & **S3B** test system for ILC type matrix - modified -	**PXD5** ILC type matrix 24x24µm² or 20x20µm² **S3B** 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