



# 7th International Workshop on DEPFET Detectors and Applications



- Recent News from Japan
- Highlights since the Bonn Meeting
- Report on BPAC at KEK (Feb. 15-16, 2011)
- This Meeting: From R&D to Production

Official statement on the Belle II homepage:

As is now well known, Japan suffered a terrible earthquake and tsunami on March 11, which has caused tremendous damage, especially in the Tohoku area.

Fortunately, all KEK personnel and users are safe and accounted for.

The injection linac did suffer significant but manageable damage, and repairs are underway. The damage to the KEKB main rings appears to be less serious, though non-negligible. No serious damage has been reported so far at Belle. Further investigation is necessary.

We would like to convey our deep appreciation to everyone for your generous expressions of concern and encouragement.

Official Statement (by M. Yamauchi as of yesterday):

The SuperKEKB project was fully approved by the Japanese Government at the end of March in spite of the tragic disaster, although we had to postpone the groundbreaking ceremony to announce this official start of the project. The damage to the facility was not serious at KEKB and Belle, and no major delay in the overall schedule of SuperKEKB is expected as a consequence of the earthquake.

- **Collaboration:** Valencia is now official member of Belle II
- **Sensors** (see DEPFET and Test sessions):  
First thinned PXD6 matrices have been produced and are being tested
- **Electronics** (see ASIC session):  
DCD is basically working at full speed and low noise
- **Services** (see Services session):  
Contract signed with FORTISS (P/S controller firmware)  
MoU ready with ITA on electromagnetic compatibility (EMC)
- **Cooling** (see Mechanics and Cooling session):  
Agreement reached with CERN/NIKHEF on common construction of a closed CO<sub>2</sub> system for PXD/SVD (and ATLAS IBL)
- **PXD simulation** (see Optimization session):  
Digitizer implemented in the BASF2 framework

BPAC = B-Factory Programme Advisory Committee

meets once per year: 5th meeting, Feb. 14-15, 2011 (Belle and Belle II)

Members:

G. Buchalla, M. Demarteau, A. Golutvin, Y. Kuno, T. Nakada (chair),  
N. Neufeld, T. Skwarnicki, M. Sullivan, W. Trischuk

Task:

Evaluate physics programme of Belle and upgrade  
program of SuperKEKB and the Belle II detector

give advice and support to the Belle / Belle II projects

Product:

report with analysis of presentations + recommendations

Some passages from the report:

## 4.3 Tracking

The Belle II tracking system consists of Pixel Detector (PXD) surrounding the beam pipe at the interaction region, followed by Si micro-strip Vertex Detector (SVD) and Central Drift Chamber (CDC). As reported in Section 4.5.2, the collaboration is in the process of establishing a full GEANT4 simulation for the entire detector. It is very encouraging to note that people are taking a keen interest in working on the development of the tracking. There is significant progress in developing a CO<sub>2</sub> based cooling system by the PXD group that will also cool the SVD.

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The committee is pleased to see that a new group has joined to work on the slow control system, which traditionally has been left to the end. It would be highly desirable if this involvement were to evolve to take on the slow controls system of Belle II. The group has strengthened the electrical engineering of the pixel detector with emphasis on the electrical isolation and the grounding of the detector.



## Main criticism and worry (still):

To maintain the current schedule, production of the DEPFET matrices will have to start before tests of all components, including the sensor matrix, are available. The committee is still very concerned about starting DEPFET production before a full system test of sensors and readout chain with final components can be carried out. We urge the group to continue to make a full system test before the start of production as a high priority. We do advise the collaboration to carefully evaluate the physics program and anticipated luminosity in the very early phase of Belle II operation and weigh that against the risk of starting sensor production with an incomplete test of the PXD detector. Related to this, the committee strongly recommends that the design of the interaction region allows for installation of the pixel detector within a two month shutdown.

- Prototypes of many essential components of the PXD project have now been produced (and tested)
- The functionality of each component should be checked and verified carefully before final production.
- Decisions on the final realization of each component must be made soon (to remain on schedule)
- Some examples:

final design of sensor (concerning e.g. radiation hardness)

final functionality of ASICs (Switcher, DCD, DHP)

procedure of flip-chipping ASICs + Kapton bonding

ladder glueing, PS, cooling, slow control, DAQ ...



- Highly desirable to define a „production readiness“ status for the Individual components
- How to approach this:
  - Need to consider the entire system functionality
  - Up-to-date documentation of components is mandatory
  - need to define crucial tests components and compounds
- Proposal: create a „**Technical Board**“ (component experts + PL + TC)
  - Aim: combine expertise, share the responsibility,  
maintain work packages, define milestones, watch schedule
  - Organisation: regular meetings (F2F + EVO 1 per month + ad hoc)

„Classical“ setup of 10 sessions:

Parameter Optimization and Background (C.K.)

DEPFET cell (Rainer Richter)

ASIC Development (Peter Fischer)

----- Interconnections and Module Design (Laci Andricek)

Test Systems (Jelena Ninkovic)

Beams Tests (Marcel Vos)

Services (Stefan Rummel)

----- Mechanics and Cooling (Hans-Jürgen Simonis)

DAQ and DHH (Sören Lange)

Technical Coordination (Hans-Günther Moser)