**Belle II PXD EVO Meeting**

15.3.2011

Present:

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Laci Andricek, Soeren Lange, Thomas Gessler, Andreas Ritter, Christian Kiesling, Ariane Frey, Carlos Lacasta, Shuji Tanaka, Hans Krueger, H.J. Simonis, Oksana Brovchenko Zdenek Dolezal, Mikhail Lemarenko, Christian Kreidl, Igor Konorov, Tomasz Hemperek, Manuel Koch, Stefan Rummel, Philip Pütsch, Sergey Fourletov, Martin Ritter, Peter Kodys, Petr Kubik, Bartlomiej Kisielewski, Carlos Mariñas, Andreas Wassatsch, Christian Koffmane, Andreas Moll, Susanne Koblitz, Hans-Günther Moser

[Tuesday 15 March 2011](http://indico.mppmu.mpg.de/indico/conferenceDisplay.py?confId=1209#2011-03-15) |

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| **Tuesday 15 March 2011** | [toptop](http://indico.mppmu.mpg.de/indico/conferenceDisplay.py?confId=1209#top)  |

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| 10:00 | DHP losses vs input data occupancy (20') ([files Slides](http://indico.mppmu.mpg.de/indico/materialDisplay.py?contribId=0&materialId=slides&confId=1209) pdf file  )  | Mikhail Lemarenko |

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| 10:20 | Report: Meeting on CO2 cooling plant (20') ([files Slides](http://indico.mppmu.mpg.de/indico/materialDisplay.py?contribId=1&materialId=slides&confId=1209) pdf file  )  | Christian Kiesling |

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| 10:40 | DCD-B characterisation in Bonn (10') ([files Slides](http://indico.mppmu.mpg.de/indico/materialDisplay.py?contribId=3&materialId=slides&confId=1209) pdf file  )  | Florian Luetticke |

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| 10:50 | DCD Testchip Measurements (05') ([files Slides](http://indico.mppmu.mpg.de/indico/materialDisplay.py?contribId=4&materialId=slides&confId=1209) pdf file  )  | Kreidl |

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| 11:10 | AOB (20')  |

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(http://indico.mppmu.mpg.de/indico/conferenceDisplay.py?confId=1209)

1. **DHP losses vs input data occupancy (Mikhail Lemarenko)**

At high occupancies and trigger rates data losses may occure in the DHP. Given a bandwidth of the data links of 1.2 Gbits/s the maximal occupancy would be 2.1% for untriggered operation and 5% with 30kHz trigger rate. However, due to data processing within the DHP additional losses can happen. They depend on the speed of the algorithms (hit finding) and the size of the FIFOs (The DHP has two FIFOs, one before and one after hit finding). In the present configuration 1% data loss happens at 3.25% occupancy. This is mainly limited by the speed of the hit finder. Improving the hit finder (only one clock cycle per hit) the performance can be increased to 1% loss at 3.8% occupancy. Further improvements can be achieved optimizing the data format. Presently each hit has its row and column address. However, this can be changed in a way that the row address is coded only once for all hits in a row. This reduces the data volume by 26% (at 3% occupancy).

Altogether it seems to be no problem to keep data losses below 1% at the highest possible occupancies.

This also means that there is no immediate need to run complex hit pairing or clustering algorithms in the DHP.

There was some discussion if this is already includes the occasional transfer of full frames (for monitoring) and how such data are flagged. This is included and these data are flagged.

1. **News on the CO2 cooling system (Christian Kiesling)**

A meeting on the R&D and manufacturing of the (closed) CO2 system was held at CERN, March 9. Present were:

CERN/NIKHEF: H. Postema, B. Verlaat, P. Petagna

Vienna: M. Friedl, I. Gfall

Karsruhe: T. Müller, H.-J. Simonis

MPI: C. Kiesling

The conclusions are (H. Postema):

* One system of 1-2 kW (like the system at CERN) can serve both PXD and SVD (with independent piping and regulation).
* Such a system can be built within one year (with sufficient manpower).
* However, CERN/NIKHEF does not have sufficient manpower to do this.
* Needed is one skilled person to supervise the construction by members of the CERN workshops (with help of the CERN/NIKHEF crew).

The situation is that:

* We need such a system within a year.
* We need to address compatibility with KEK rules very early.
* The person needed is not available.
* No group in the DEPFET collaboration is prepared to do this task.

Christian’s proposal is that Imanuel Gfall could work at CERN together with a technician from MPI (who seems to be available)

Christian has a list of components which he can send to KEK to check for compatibility and safety issues (However, Shuji-san has doubts whether this can be done in the near future since people will be occupied with repair work after the earthquake)

1. **DCD-B characterisation in Bonn (Florian Lütticke)**

Test of the DCD-B were preformed in Bonn with hybrid 4.1 (without DEPFET matrix). Clock frequency was 100 MHz (320 ns sampling time). The first test showed strong gradients in the noise and gain across the chip. This was traced to a bad bond connection of the power lines. When this was fixed, the performance got reasonably uniform. When measuring the noise strange structures (at ADC values .5 and 1) were observed. This may be caused by steps in the ADC response (missing ADC values). A scan of ADC values shows that certain values never occur.

1. **DCD-Testchip measurements (Christian Kreidl)**

The DCD Test chip works well up to 400 MHz clock frequency (80 ns sampling rate). Note: the required rate is 105 ns. Noise is very good (30 – 54 nA). The plan is to submit the full chip in two weeks (expected back in >5 months – including bumping). The work is now concentrating on yield and debugging features will be added.

The footprint will not change with respect to the old DCD-B. The JTAG reset will now be compatible with DHP and switcher.

1. **AOB**

DHP 0.2 is prepared for submission in May. Hans Krüger asked Rainer for the GDS file of the footprint (metal I) on the DEPFET PXD 6 matrices.

Column switching will be the same as for DCD-RO.

Electrical module will be designed for DHP 0.2. A full size DHP will only be available end of 2012.

In order to accelerate tests of the mounting of the Kapton on the EOS it was decided to order additional (but short) Kapton tapes from the German supplier (which has a faster turnaround than the Japanese supplier)

Next meeting: April 5 (Tuesday) 10:00