8th International "Hiroshima" Symposium on the Development and Application of Semiconductor Tracking Detectors, Taipei, Taiwan

Contribution ID: 42

Type: ORAL

## The DEPFET pixel detector for the BELLE II project

Monday 5 December 2011 14:50 (20 minutes)

The upgrade of the KEKB accelerator towards a luminosity of 8\*10^35 1/cm2s poses several challenges for the BELLE II detector. Especially detectors close to the interaction point will be faced with a significant radiation of several Mrad per year as well with a high hit density. To cope with this a silicon pixel detector will be used for the innermost layers of the silicon tracker.

The pixel detector (PXD) consists of two layers DEPFET active pixel sensors. The DEPFET technology has an unique set of advantages like good intrinsic signal to noise ratio, low power dissipation in the active area, flexible device size, radiation hardness and a thinning technology allowing to adjust the thickness of the device over a wide range. The layers placed at a radius of 14mm and 22mm and the material budget of approximately 0.16%X0 will improve the IP resolution significantly compared to the previous installed silicon detector.

The PXD detector system consists of the full silicon DEPFET modules with integrated readout ASICS, the data handling hybrid receiving the data and sending them the compute nodes where online pattern recognition is performed. Moreover the powers supply system providing the supply voltages for the DEPFET modules. The power distribution provides low output impedance over all frequencies and a transient response with appropriate overshoots in case of fast varying loads. The power supply system involves several challenges – more than 800 voltages, tight requirements on regulation and noise.

In my talk I will give an overview on the status of the detector R&D with focus on the power supply system.

Author:Dr RUMMEL, Stefan (LMU Munich)Presenter:Dr RUMMEL, Stefan (LMU Munich)Session Classification:Pixels (including CCD's)

Track Classification: Pixels (including CCD's)