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Ultra-thin Active Pixel Detector for the Belle II VXD

The asymmetric electron/positron accelerator SuperKEKB at KEK in Japan is designed to provide an instantaneous luminosity of $8 \times 10^{35} \text{ cm}^{-2} \text{ s}^{-1}$ - 40 times higher than that of the KEKB collider. For high-precision track reconstruction, e.g. for measurements of time-dependent CP-violating decays and secondary vertices, the Belle II detector will be equipped with two layers of ultra-thin ($75 \mu\text{m}$) active pixel detectors (PXD) close to the interaction point. The PXD consists of roughly 8M DEPFET pixels, which provide in-pixel amplification, high signal-to-noise ratio and non-destructive pulse height readout. The read-out and control ASICs are integrated onto the all-silicon module. The large stream of PXD data will be handled by several FPGA based data acquisition systems (DHE, ONSEN and DATCON). For the commissioning of the Belle II detector and SuperKEKB accelerator the BEAST detector is currently installed. Next to several radiation monitors it consists of 2 layers of the PXD and 4 layers of SVD. After machine tuning the first collisions are expected for the spring of 2018. In the meantime the production and commissioning of the final PXD is ongoing at full swing. This contribution will give an overview of the pixel detector and the status of the BEAST and final PXD detectors.

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