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The Belle II DEPFET vertex detector: current status and future plans

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An upgrade of the existing Flavour Factory KEKB (Tsukuba, Japan) is under construction, and is foreseen for commissioning by the end of 2014. This new e+e- machine (”SuperKEKB”) will deliver an instantaneous luminosity of 8x1035 cm-2s-1, which is 40 times higher than the the world record set by KEKB.

In order to be able to fully exploit the increased number of events and provide high precision measurements of the decay vertex of the B meson systems in such a harsh environment, the Belle detector will be upgraded (”Belle II”) and a new silicon vertex detector, based on the DEPFET technology, will be designed and constructed. The new pixel detector, close to the interaction point, will consist of two layers of DEPFET active pixel sensors. This technology combines the detection together with the in-pixel amplification by the integration, on every pixel, of a field effect transistor into a fully depleted silicon bulk. In Belle II, DEPFET sensors thinned down to 75 um with low power consumption and low intrinsic noise will be used.

In the talk, though the full system will be described, an introduction to the sensor technology together with the electronics chain and the expected performance will be presented.

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