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Impact of the Belle II Pixel Detector on CP -Violation Measurements

The new asymmetric electron positron collider SuperKEKB in Tsukuba, Japan, is currently being commissioned. With a design luminosity of $8 \cdot 10^{35} \text{ cm}^{-2} \text{ s}^{-1}$ and an expected integrated luminosity of about 50 ab^{-1} , it will surpass the world record reached by its predecessor KEKB by a factor 50. In order to reach the high instantaneous luminosity, the beam energy asymmetry has to be reduced, resulting in a lower boost. This, together with the expected increase of machine background, sets high requirements to the new Belle-II detector, which is under construction.

In order to fully exploit the high luminosity, a new Belle-II pixel vertex detector has been developed. Consisting of two layers of thin, monolithic pixel sensors in DEPFET technology, mounted at 14 mm and 22 mm from the interaction point, it will cope with the strongly increased machine background, providing excellent precision for three-dimensional vertex measurements of particles decaying inside the beam pipe.

The physics performance of the Belle-II pixel vertex detector and its impact on the reduction of experimental uncertainties will be treated with focus on the measurement of the CP -Violating parameters in various B and D decay modes.

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