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The Belle-II Pixel Vertex Tracker at the SuperKEKB Flavor Factory

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Please give a brief summary of your poster

Building on the success of the current KEKB flavor factory and the Belle experiment, which helped to firmly establish the CKM picture of quark mixing and CP violation in the Standard Model, a luminosity upgrade of the machine is planned. This new super flavor factory, SuperKEKB, will deliver a luminosity of 8 x 10^35 / cm^2s, a factor of 40 increase over the present luminosity world record. With these increased statistics, precision measurements in the flavor sector are possible which can probe new physics well beyond the scales accessible to direct observations.

The increased luminosity also requires upgrades of the Belle detector. Of critical importance here is a new silicon pixel vertex tracker, which will significantly improve the decay vertex resolution, crucial for time dependent CP violation measurements. This new detector will consist of two layers of DEPFET pixel sensors close to the interaction point. These sensors combine particle detection and amplification of the signal by embedding a field effect transistor into fully depleted silicon, providing very high signal to noise ratios and excellent spatial resolution with 50 µm thick silicon. This technology satisfies the requirements of extremely low material in the active region and high radiation tolerance at Belle-II. The poster will outline key physics objectives and describe the sensor technology as well as the overall concept of the pixel vertex tracker upgrade.

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