

# The Silicon Vertex Detector of the Belle II Experiment

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In 2019 the Belle II experiment started data taking at the asymmetric SuperKEKB collider (KEK, Japan) operating at the  $Y(4S)$  resonance. Belle II will search for new physics beyond the Standard Model by collecting an integrated luminosity of 50 ab<sup>-1</sup>.

The Silicon Vertex Detector (SVD), consisting of four layers of double-sided silicon strip sensors, is one of the two vertex sub-detectors. The SVD extrapolates the tracks to the inner pixel detector (PXD) with enough precision to correctly identify hits in PXD belonging to the track. In addition the SVD has standalone tracking capability and utilizes specific ionization to enhance particle identification in the low momentum region.

The SVD is operating reliably and with high efficiency, despite exposure to the harsh beam background of the highest peak-luminosity collider ever built. High signal-to-noise ratio and hit efficiency have been measured, as well as the precise spatial resolution; all these quantities show excellent stability over time. Data-simulation agreement of some discrepancy on cluster properties has recently been improved through a careful tuning of the simulation. The precise hit-time resolution can be exploited to reject out-of-time hits induced by beam background, which will make the SVD more robust against higher levels of backgrounds.

During the first three years of running, radiation damage effects on strip noise, sensor currents, depletion voltage, have been observed, as well as some coupling capacitor failure due to intense radiation bursts. None of these effects cause significant degradation in the detector performance.

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