Contribution ID: **275** Type: **Live Presentation**

The Silicon Vertex Detector of the Belle II Experiment

Tuesday 22 February 2022 11:50 (20 minutes)

Since the start of data taking in spring 2019 at the Super-KEKB collider (KEK, Japan) the Silicon Vertex Detector (SVD) has been operating reliably and with high efficiency, while providing high quality data: high signal-to-noise ratio, greater than 99% hit efficiency, and precise spatial resolution. These attributes, combined with stability over time, results in good tracking efficiency.
Currently the occupancy, dominated by background hits, is quite low (about 0.5 % in the innermost layer), causing no problems to the SVD data reconstruction. In view of the operation at higher luminosity foreseen in the next years, specific strategies aiming to preserve the tracking performance have been developed and tested on data. The observed trigger jitter allows reduced sampling of the strip amplifier waveform. The good hit-time resolution can be exploited to further improve the robustness against the higher levels of background. First effects of radiation damage on strip noise, sensor currents and depletion voltage have been measured: they do not have any detrimental effect on the performance of the detector. Furthermore, no damage to the SVD is observed after sudden and intense bursts of radiation due to beam losses.

Primary experiment

Belle II

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Session Classification: Large Detector Systems

Track Classification: Semiconductor Detectors