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Belle II Silicon Vertex Detector

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The Belle II experiment at the SuperKEKB collider is the next-generation flavor factory, which will operate at an unprecedented instantaneous luminosity of $8 \times 10^{35} \text{ cm}^{-2} \text{ s}^{-1}$, about 40 times larger than its predecessor Belle experiment. Its vertex detector is composed of a two-layer DEPFET based pixel detector (PXD) and four-layer double-sided silicon microstrip detector (SVD). To achieve a precise vertex reconstruction and excellent low-momentum tracking, even under the harsh background and high trigger rate of 30 kHz, the SVD employs several innovative techniques. To minimise the capacitive noise, 1,748 APV25 ASIC chips that read out signals from 224k strips, are directly mounted on the modules relying on the novel Origami concept. The analog signals from APV25 after digitised by an FADC system are sent to the central DAQ and also to online tracking system based on SVD hits to provide the region of interests to PXD, enabling reduction of the latter data size to achieve the required bandwidth and data storage space. In this talk, we highlight design principles and construction status of the Belle II SVD, before closing with the path towards its integration and commissioning.

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