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## Belle II Silicon Strip Detector Upgrade

The Belle II experiment at the SuperKEKB accelerator in KEK, Japan is the next-generation luminosity frontier experiment, 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. The Belle II vertex detector consists of a two-layer DEPFET based pixel detector (PXD) and four-layer silicon vertex detector (SVD). Each SVD layer is formed by cylindrically arranged ladders around the beam pipe, and each ladder is composed of an array of double-sided silicon strip sensors. The innermost, second, third, and outermost SVD layers are composed of seven, ten, twelve, and sixteen ladders, respectively. The SVD has a characteristic lantern structure in order to increase the detector acceptance on the forward side while reducing the total number of sensors required. Most of the ladders have a kinked shape to account for the lantern structure.

We had developed the ladder assembly procedure after an intensive R&D program because of the very complicated structure of the ladders. All the ladders needed for the Belle II operation had been assembled and qualified at the SVD institutes, and then, they were transported to KEK. These ladders for the operation had been successfully mounted to the SVD structure, which is composed of two lengthwise half cylinders called half shells. Cooling pipes to chill the readout ASICs on the ladders by dual-phase  $\text{CO}_2$  were also mounted on the half shells. The fully fabricated first half-shell is under an integrated commissioning test using cosmic ray muons. Several tracks of the cosmic ray muons are already clearly observed by the first half-shell ladders. The commissioning test for the second half-shell is foreseen very soon.

Besides the commissioning test of the half shells, two PXD and four SVD ladders are installed on the SuperKEKB beam line to test the performance of the ladders especially in terms of the position resolution of cosmic ray muons and the particles from the  $e^+e^-$  collisions.

In this talk, we present the latest commissioning test results of the Belle II SVD and the results of the early performance test of the partial SVD installed on the SuperKEKB accelerator.

**Primary author:** HIGUCHI, Takeo (Kavli IPMU)

**Presenter:** HIGUCHI, Takeo (Kavli IPMU)