

Running Experience with the Novel Time of Propagation (TOP) Barrel PID Detector in the Belle II Experiment

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The Time of Propagation (TOP) detector is a novel particle identification system developed for the barrel region of the Belle II detector at the SuperKEKB collider at KEK in Tsukuba, Japan. The detector is based on reconstructing the emission angle of Cherenkov photons generated in its quartz radiator bars by measuring the propagation time of individual photons to the Micro-Channel Plate PMT sensor plane. The readout electronics for the 8192 channels of the TOP system are built around a switched capacitor array waveform sampling ASIC operating at 2.7 GSa/s. Realtime processing in the front end electronics extracts the individual timing of detected photons to better than 100 ps.

The physics programme of Belle II is underway since March 2019, with continuously increasing luminosity delivered to the detector. This talk presents the current experiences and results from commissioning, calibration and operation of the Belle II TOP detector in these first Belle II physics runs.

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