

Belle II iTOP Particle Identification Detector: Construction, Operation and Commissioning

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The imaging Time Of Propagation (iTOP) counter is the primary Particle Identification (PID) system in the barrel region of Belle II. It contains 16 identical modules between the tracking detectors and the calorimeter. The key elements of each module are the quartz radiator, the Micro-Channel Plate PhotoMultiplier Tubes (MCP-PMTs), and the front end readout electronics. The Cherenkov photons produced by the passage of charged particles through the quartz propagate through the quartz radiator. After multiple internal reflections they reach the MCP-PMTs. Multi-gigasample per second (GSa/s) waveform sampling Application Specific Integrated Circuits (ASICs) are used in readout to provide precise photon timing. Arrival times and positions of the photons are used to identify particles. The construction and installation of the iTOP detector was completed successfully in 2016. The iTOP counter has been in the Phase 2 commissioning together with the other Belle II sub-detectors since February 2018. This talk presents the construction, general principles of operation, and commissioning of the Belle II iTOP detector.

Primary authors: Dr ATMACAN, Hulya (University of Cincinnati); ON BEHALF OF THE BELLE II ITOP GROUP

Presenter: Dr ATMACAN, Hulya (University of Cincinnati)

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