Contribution ID: **313** Type: **not specified**

# An imaging time-of-propagation system for charged particle identification at a Super B factory

*Friday 31 July 2009 14:50 (25 minutes)*

Super B factories that will perform precision tests of the flavor sector of the Standard Model and searches for new physics will demand excellent charged particle identification (PID), particularly K/π separation, for momenta up to 4 GeV/c, as well as the ability to operate under beam backgrounds significantly higher than current B factory experiments. We describe an Imaging Time-of-Propagation (iTOP) detector which shows significant potential to meet these requirements. This detector utilizes the concept of detection of internally reflected Cerenkov light (DIRC), but with an imaging plane of significantly reduced size relative to previous DIRC implementations. This imaging plane is instrumented with finely pixelated photodetectors with timing resolution of ˜50 ps. Precision measurements of photon arrival times are supplemented with the two dimensional imaging information to provide excellent PID capability in a compact detector envelope. Results of ongoing optimization of the configuration of such a detector are presented, as well as simulated PID performance.

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**Session Classification:** Detectors II

**Track Classification:** Detector Technology and R&D