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A new charged particle detector for the KOTO experiment at J-PARC.

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The KOTO experiment at J-PARC is searching for the $K_L \rightarrow \pi^0 \nu \bar{\nu}$ decay, which is one of the most sensitive probes to new physics beyond the Standard Model. Its signature is a pair of photons from a π^0 decay without any additional activity in a hermetic detector system surrounding the decay region. In order to detect this highly suppressed decay, expected at the 3×10^{-11} level, it is important to reject background events related to other kaon decay modes. Recently, KOTO achieved an experimental sensitivity of 1.3×10^{-9} and upgraded some detector systems for further improvements. The Downstream Charged Veto(DCV) is one of them, designed to further reject background events related to $K_L \rightarrow \pi^+ \pi^- \pi^0$ decay. To detect charged pions, the DCV is composed of two plastic scintillator pipes read out by MPPCs through wavelength shifting fibers. It is placed inside the beam pipe where is the limited space. The First beam commissioning was finished on April 2019. We will present the fabrication process and performance of the DCV.

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