

# Development of a Scintillator-based Veto Counter for High-Intensity Pion Beam Experiments at J-PARC E45

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The J-PARC E45 experiment investigates baryon resonances such as  $N^*$  and  $\Delta^*$  using high-intensity pion beams. To suppress background events originating from unreacted pion beams of up to  $\sim 1$  M/spill passing through the target, we developed a scintillator-based veto counter system. The detector consists of 32 scintillator segments, each with dimensions of  $2 \times 10 \times 140$  mm<sup>3</sup>. Each segment is coupled to wavelength-shifting (WLS) fibers using optical adhesive and is read out by MPPCs to ensure stable operation under the strong magnetic field of the Hyperon Spectrometer. Aluminized-Mylar reflectors are employed to maximize light collection efficiency. The overall detector design and optimization were based on Geant4 simulations combined with trigger studies. We present the fabrication process of the veto counter system and report its performance as evaluated in beam tests at the J-PARC K1.8BR beamline.