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The backscatter detector system of PERC

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The PERC (Proton Electron Radiation Channel) instrument is a neutron decay facility currently being set up at the research reactor FRM II of the Heinz Maier-Leibnitz Zentrum in Garching. Its main component is a 12-meter long superconducting magnet system, which was recently delivered to the FRM II.

We aim to measure several correlation coefficients in neutron beta decay one order of magnitude more precisely than previous experiments. From the results, we will derive the nucleon axial coupling and the CKM matrix element $_{ud}$ and search for scalar and tensor couplings.

The spectrum of electrons from neutron decay will be obtained using two detector systems: the primary detector system located downstream will be a scintillation or silicon detector or a magnetic spectrometer. The secondary detector system, used to identify and veto backscatter events, consists of two pixelated scintillation detectors read out by silicon photomultipliers.

This poster presents the current status of the design of this the secondary detector system, including results from Geant4 simulations validated by measurements with pions at the PSI.

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