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Silicon detector for neutron beta decay measurements with PERC

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The PERC facility is currently under construction at the MEPHISTO beamline of the FRM II. It will serve as an intense and clean source of electrons and protons from neutron beta decay for precision studies. It aims to improve the measurements of the properties of weak interaction by one order of magnitude and to search for new physics via new effective couplings.
PERC's central component is a 12 m long superconducting magnet system that has recently been delivered. It hosts an 8 m long decay region in a uniform field. An additional high-field region selects the phase space of electrons and protons, which can reach the downstream detector and systematic uncertainties.
The downstream main detector and the two upstream backscattering detectors, will initially be scintillation detectors with (silicon) photomultiplier readout. In a later upgrade, the downstream detector will be replaced by a pixelated silicon detector. We present the current design status of the silicon detector prototype.

Primary author: LEBERT, Manuel (Technical University Munich)

Co-authors: LAMPARTH, Max (TUM); KLENKE, Jens (FRM II); BERNERT, Karina (TUM); MÄRKISCH, Bastian (Physik-Department, TUM)

Presenter: LEBERT, Manuel (Technical University Munich)

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