

# DANAE - a new experiment for direct dark matter detection with DEPFET silicon detectors

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The sub-GeV mass region of the dark matter is foreseeably to be explored intensively in the next generation of direct detection experiments. Essig and others [1] recently discussed the feasibility of detecting the dark-matter electron recoil using low-noise semiconductor detectors as the active target. With a readout noise level below one electron RMS, the sensitivity allows us to test several theoretical models that account for dark matters with sub-GeV mass.

One of the two silicon-based architectures that are capable of reaching such noise level is the DEPFET with Repetitive Non Destructive Readout (RNDR). The prototype of this detector has been developed by the Semiconductor Laboratory of the Max Planck Society, and the readout of a single pixel has successfully reached the expected sub-electron noise level as reported in [2].

In this presentation, we will introduce the working concept of the DEPFET-RNDR. Then we will present the new project of DANAE under preparation that plans to apply this type of detector to the direct detection of dark-matter electron recoil.

[1] R. Essig, et al., J High Energ. Phys. 2016, 46(2016).

[2] A. Bähr, H. Kluck, J. Ninkovic, J. Schieck, and J. Treis, Eur. Phys. J. C 77, 905(2017).

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