



Contribution ID: 41

Type: Talk

DANAE –A new attempt to search for Dark Matter with DEPFET-RNDR detectors

Thursday 26 July 2018 15:20 (20 minutes)

Motivated by various theoretical models, the direct search for dark matter (DM) at the sub-GeV/c² mass scale gained special interest during the last years. In case of individual DM-electron interactions in Si-semiconductor devices, this requires a readout noise level of less than 1e- RMS.

The *Depleted P-channel Field Effect Transistor* (DEPFET) with *Repetitive Non Destructive Readout* (RNDR) is one possible technique which promise a sub-electron noise level. Such a low noise level was successfully demonstrated with a single pixel DEPFET-RNDR prototype [1]. DANAE is a new follow-up project aiming to apply the DEPFET-RNDR technique to the direct search for DM-electron interactions. This intends the assembly of a setup with a detector matrix of 64x64 pixels as well as an optimization of the dark current and the readout frequency.

In this contribution we will introduce the DEPFET-RNDR technique and the DANAE project. Afterwards, the status of the ongoing R&D work will be reported which is currently focused on the setup construction and the investigation of the temperature dependence of the dark current. Finally we will discuss future prospects of DANAE.

[1] A. Bähr, H. Kluck, J. Ninkovic, J. Schieck and J. Treis, Eur. Phys. J. C77 (2017) 905, arXiv:1706.08666

I am also submitting an abstract to the track Low Background Techniques.

Author: KLUCK, Holger (HEPHY & TU Wien)

Co-authors: TREIS, Johannes (MPG Semiconductor Laboratory); SHI, Hexi (HEPHY); SCHIECK, Jochen (Austrian Academy of Sciences (AT)); NINKOVIC, Jelena (MPG Halbleiterlabor); BÄHR, Alexander (MPG-HLL)

Presenter: KLUCK, Holger (HEPHY & TU Wien)

Session Classification: 4.3 Direct Detection

Track Classification: Direct Detection