

KSETA report 2020

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During 2020 two measurement campaigns at the KATRIN experiment were performed, namely KNM3 and KNM4. My tasks during this time are steadily updating analysis of the background behaviour. As well as the analysis of dedicated background measurements before and after each campaign. By doing so, I made a self-study on learning the Julia programming language. My whole analysis chain of processed data is now written in Julia. Also plots are nicely displayable.

The more time-consuming task during 2020 was the operation of the monitor spectrometer at KATRIN. This spectrometer is established as a monitoring device of the main spectrometers high voltage by steadily measuring krypton conversion line of $^{83\text{m}}\text{Kr}$. For this automated measurement during the individual campaigns, maintenance is necessary. Since the components are old – from the former Mainz Experiment – e.g. the super conducting magnets have to be filled with LHe each week. In addition, exchanging of pumps and other peripherals occurred.

Get into the operation of the monitor spectrometer as an expert in a project management role greatly enriches my work as I hold responsibility over scientific work and manpower. After KNM4 we had major changes at the monitor spectrometer with our colleagues from Munich. A new generation of detectors – TRISTAN will be operated in the future at KATRIN and are now tested at the monitor spectrometer as a standalone device. In last autumn we successfully installed such a silicon drift detector of the 1st generation at the monitor spectrometer and performed a bunch of calibration and reference measurements. Such as optimisation of detector high and low voltage calibration as well as resolution measurements with a radioactive ^{55}Fe source in the environment of UHV and strong magnetic fields. Those measurements are still continued and will be followed by a further optimised detector for the monitor spectrometer in spring 2021. Beside the work at the monitor spectrometer itself, regular scientific and technical meetings are hold on a weekly basis.