

Measuring the free neutron lifetime with spin-polarized ultracold neutrons at TRIGA Mainz

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Ultracold Neutrons (UCN), neutrons with kinetic energies below 335 neV, provide a unique tool for fundamental neutron research with long observation times.

The τ SPECT experiment, which is currently being commissioned at the pulsed UCN source of the TRIGA Mainz, aims to utilize this fact in order to precisely measure the free neutron lifetime.

In order to reduce systematic errors with respect to previous storage experiments using material bottles, τ SPECT will implement 3D magnetic storage of spin polarized UCN and will be able to measure both the decaying and the surviving UCN.

An introduction to UCN and their properties will be given as well as a description of the τ SPECT experiment and the planned neutron lifetime measurements at the TRIGA Mainz.

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