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## The neutron lifetime experiment tSPECT

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The decay of the free neutron into a proton, electron and antineutrino is the prototype of semi-leptonic weak decays and plays a key role in particle physics and astrophysics. The most precise measurement of the neutron lifetime to date use ultra-cold neutrons (UCN) stored in material vessels. Their accuracy is limited by systematic errors, mainly caused by anomalous losses of UCN during storage at the vessel walls. With the magnetic storage of neutrons these systematic limitations can be avoided and an accuracy of 0.3s for the lifetime of the neutron can be reached. In Mainz the neutron experiment tSPECT has been set up, which uses a combination of magnetic multipole fields for radial storage and the superconducting aSPECT magnet for longitudinal storage of UCN. In a first phase the goal is to measure the neutron lifetime with a precision of  $\sim 1$ s. In this presentation, the status of tSPECT and the results of the first commissioning measurements will be presented.

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