

“The life and death of the free neutron”

Below is an abstract:

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While a neutron within a nucleus may be unconditionally stable, the free neutron is unstable and beta decays with a lifetime of approximately 10 minutes. Neutron decay is the simplest example of nuclear beta decay and, as a result, the value of the neutron lifetime is a parameter of considerable importance to a wide variety of physical systems. These range from astrophysics to particle physics to cosmology. Particularly noteworthy is role played by the neutron lifetime in the Big Bang where it sets the time scale for nucleosynthesis. Given this interest in the neutron lifetime, it is somewhat distressing to observe that the measurements of the neutron lifetime having the lowest quoted uncertainties are in disagreement with one another. I will review this “neutron lifetime problem,” discuss some theoretical implications, outline the current experimental landscape and the prospects for future experiment prospects.