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Recent Developments in Beam Neutron Lifetime Experiments

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Neutron decay is the prototype for nuclear beta decay and other semileptonic weak interactions. The value of the neutron lifetime and angular correlation coefficients can be used to determine the weak coupling constants G_A, G_V, and the CKM matrix element V_{ud}. Neutron decay was important in the early universe and the lifetime is needed in theoretical calculations of primordial element abundances. Two main experimental methods, the neutron beam method and the ultracold neutron storage method, unfortunately now disagree by more than 8 seconds (4 standard deviations). I will review recent and current neutron lifetime experiments using the beam method, including systematic tests using the NIST apparatus and the upcoming BL3 experiment.

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