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Probing the Weak Interaction with Neutron Beta Decay

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The neutron has proven to be an excellent tool for studying the fundamental forces of nature. Studies of the free neutron's decay to a proton, electron, and antineutrino can give us our most precise understanding of the charged weak interaction of quarks and allows us to search for hints of new physics and interactions missing from the Standard Model of Particle Physics. The next generation of experiments to measure the lifetime and angular correlations in neutron beta decay faces significant challenges to push to even higher precision and stronger limits. I will give an overview of the motivation and history of neutron beta decay, and discuss how the cutting edge experiments today are approaching these challenges.