

aCORN: A New Experiment to Measure the Electron-Antineutrino Correlation in Neutron Decay

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The angular correlation between the beta electron and antineutrino in nuclear beta decay is characterized by the dimensionless parameter a . The value of a for free neutron decay, when combined with other neutron decay parameters, can be used to determine the weak vector and axial vector coupling constants g_V and g_A and test the validity and self-consistency of the Electroweak Standard Model. Previous experiments that measured a in neutron decay relied on precise proton spectroscopy and were limited by systematic effects at about the 5% level. The aCORN experiment relies on a new method of measuring a for which systematic uncertainties promise to be much smaller. The apparatus is now being constructed. There will be a test run at the *LENS* facility at Indiana University in 2007 after which the experiment will run at NIST in 2008. We expect an ultimate precision of $< 1\%$ in a . This work is supported by the National Science Foundation.