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Simultaneous measurement of β asymmetry and Fierz interference in neutron decay[1] KEVIN HICKERSON, California Institute of Technology, UCNA COLLABORATION — The Standard Model allows for only vector and axial-vector charged and flavor changing currents. The proportion between these two currents is given by the axial-vector coupling constant, g_A, determined by the strong structure of the nucleon. This ratio cannot be computed exactly, but can be extracted by measuring the beta decay asymmetry parameter, A. Another parameter, the Fierz Interference term in neutron beta decay, b_n, serves as a test for non-Standard Model currents. A non-zero b_n skews the peak of the beta energy spectrum and simultaneously dilutes the asymmetry in an energy dependent way, modifying the experimentally measured value of A. The UCNA experiment, at the Los Alamos Neutron Science Center in New Mexico, used ultracold neutrons to measure A, as well as put limits on b_n, and determine its impact on A. The largest obstacle to determining these limits is systematic effects associated with the energy calibration of the UCNA calorimetry system. We report on the results of new studies of these systematic effects using improved analysis techniques and simulations.

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