

Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

The Adiabatic Fast Passage magnet for Ultracold Neutron spin manipulation MARIE BLATNIK, Los Alamos National Lab, UCNA COLLABORATION, UCNB COLLABORATION — The Ultracold Neutron source at the Los Alamos Neutron Science Center is used to investigate the weak interaction of the Standard Model through the decay of the free neutron, such as a precise measurement of the correlations between the decaying neutron's polarization and the emitted electron or neutrino momenta (the A and B correlation coefficients). These angular correlation measurements require precise control of the neutron polarization. The neutrons are polarized by a 7-Tesla magnetic field, and their spins are flipped by a radio-frequency birdcage resonator using the adiabatic fast passage technique in a 1-Tesla field. Precise knowledge of their polarization and spin-flip efficiency requires the achievement of greater than roughly 99% polarization and 99.9% spin-flipper efficiency. This target performance requires precise characterization and control of the static magnetic field profile in the spinflipper, and the resonator must produce large, uniform radio-frequency fields at 29.2 MHz. Studies of the static field profile in our spin-flipper and measurements of the performance of a modified resonator utilizing silver-coated components will be presented along with its impact of our measurements and the system's performance optimization.

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Date submitted: 19 Jul 2014

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