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High Efficiency Spin Flipper for the n3He Experiment CHRISTOPHER HAYES, Univ of Tennessee, Knoxville, N3HE COLLABORATION — The n^3He experiment, constructed on the Fundamental Neutron Physics Beamline (FnPB) at the Spallation Neutron Source, is designed to measure the parity violating (PV) proton asymmetry A_p in the capture reaction

$$n + {}^3\mathrm{He} \longrightarrow {}^3\mathrm{H} + \mathrm{p} + 765\,\mathrm{keV} \quad (1)$$

The asymmetry has an estimated value $A_p \sim -1 \times 10^{-7}$ and is directly related to the weak isospin conserved couplings h^0_ρ and ω^0_ρ which are of fundamental interest in the verification of the meson exchange model of low energy NN intereactions. Data production for the n^3He experiment began in February 2015 and is scheduled to continue thru December 2015 – reaching a statistical sensitivity $\delta A_p \sim 10^{-8}$ or better. I will discuss the spin flipper which is designed using the theory of double cosine-theta coils, and capable of flipping neutron spins with an efficiency approaching its maximum value $\epsilon_{sf} = 1$. I will also discuss the theory of Spin Magnetic Resonance (SMR) and how it is employed by the spin flipper to flip 60 Hz pulses of cold neutrons over a range of wavelengths.

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