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Calibrating a new polarimetry, pulse NMR, with NMR for the polarized ^{3}He target. CALEB FOGLER, Old Dominion University — One of the goals of the Thomas Jefferson National Accelerator Facility (JLab) is the study of the proton and neutron structures. A polarized ^{3}He target provides an effective polarized neutron target to study the neutron spin structure. The target polarization is measured with nuclear magnetic resonance (NMR) and electron paramagnetic resonance. New experiments for the JLab 12 GeV program require upgrades to the target which needs a new type of polarimetry – pulse NMR (PNMR). PNMR uses a radio frequency field to perturb the ^{3}He spins which then undergo free induction decay. The amplitude of this oscillating decay is proportional to the ^{3}He polarization. The PNMR needs to be calibrated with regular NMR. This project is to perform these calibrations and to study the systemic effects of PNMR. NMR and PNMR measurements were performed sequentially multiple times. ROOT was used to analyze the data and extract the amplitudes of the measurements which are proportional to the polarizations. These amplitudes were plotted to study the PNMR against the established NMR measurements. PNMR appears to have a linear relationship with NMR. The step remaining is to study the systematic uncertainties of the PNMR. When the study is completed, the new polarimetry will be established.

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