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Shimming of a Magnet for Calibration of NMR Probes for the Muon g-2 Experiment RACHEL BIELAJEW, University of Michigan — The Muon g-2 Experiment at Fermilab aims to measure the anomalous magnetic moment a ? (g-2)/2 of the muon to the precision of 0.14 parts per million. This experimental value of a can then be compared to the similarly precise theoretical predictions of the Standard Model in order to test the completeness of the model. The value of a is extracted from muons precessing in a magnetic field. The magnetic field will be measured with a set of 400 Nuclear Magnetic Resonance (NMR) probes, which have the ability to measure the field to a precision of tens of parts per billion. NMR probes will be tested using a 1.45 Tesla magnet at the University of Washington Center for Experimental Nuclear Physics and Astrophysics (CENPA). In order to achieve a significant signal from NMR probes, the magnetic field in which the probes are immersed must be extremely uniform. The existing magnet at CENPA has an approximately linear gradient in magnetic field of about 1 Gauss per centimeter in the smoothest direction. A pair of adjacent square Helmholtz coils was designed and built to create a linear gradient in order to cancel the existing gradient. The length of the NMR signals improved with the implementation of the coils. The results of the addition of the coils to the magnet on the signals from the NMR probes will be presented.

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