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A gaseous ^{3}He NMR probe at 4.2K for precision measurements of electron and positron magnetic moments XING FAN, Harvard University, Northwestern University, SAMUEL FAYER, GERALD GABRIELSE, Northwestern University — A 4.2 K cold bore magnet is used in the new electron's and positron's magnetic moments experiment. In order to optimize the homogeneity of the magnet at 5 Tesla, a gaseous ^{3}He NMR probe based on a two-volume method is developed. A high signal-to-noise ratio comparable to a room temperature water NMR probe is achieved, and the relaxation time constants T_1, T_2, and T_2^* have been measured. We also discuss the stability and the homogeneity of the cold bore magnet studied with the ^{3}He probe.

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