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Magnetic Trapping and Zeeman Relaxation of NH Molecules
EDEM TSIKATA, WESLEY CAMPBELL, Department of Physics, Harvard University; Harvard-MIT Center for Ultracold Atoms, HSIN-I LU, School of Engineering and Applied Science, Harvard University; Harvard-MIT Center for Ultracold Atoms, LAURENS VAN BUUREN, JOHN DOYLE, Department of Physics, Harvard University; Harvard-MIT Center for Ultracold Atoms — NH molecular radicals are magnetically trapped in the presence of a helium buffer gas and their Zeeman relaxation and energy transport collisional cross-sections with helium are measured. Molecules are loaded from a molecular beam into a cold buffer gas cell in a 4T anti-Helmholtz magnetic trap. The NH-He energy transport cross-section is measured to be $2.7\pm$ 0.8 $\times 10^{-14}$cm^2 at 710 mK. The inelastic (Zeeman state changing) cross-section is also measured to be 3.8 $\pm$ 1.1$\times 10^{-19}$cm^2 at 710 mK, indicating a γ (elastic to inelastic cross-section ratio) of 7×10^4, in agreement with the theory of Krems et al (PRA 68 051401(R) (2003)). Cross-section measurements are obtained for the interaction of the molecular isotopes ^{14}NH, ^{14}ND, ^{15}NH and ^{15}ND with the helium isotopes He-3 and He-4.

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