

Abstract Submitted  
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**Ultracold NH-NH collisions in magnetic fields** GERRIT GROENENBOOM, LIESBETH JANSSEN, AD VAN DER AVOIRD, Radboud University Nijmegen, PIOTR ZUCHOWSKI, JEREMY HUTSON, Durham University — The production of cold and ultracold molecules opens up the possibility to control chemical reactions by means of electromagnetic fields. The NH ( $^3\Sigma^-$ ) molecule is a promising candidate for cold controlled chemistry, due to its large electric and magnetic dipole moment. We constructed high level, *ab initio*, singlet, triplet, and quintet interaction potentials, with analytic long range expansions for the entrance channel for chemical reaction [1]. We present preliminary quantum scattering calculations of the elastic and Zeeman relaxation cross sections from the cold (1K) down to the ultracold ( $10^{-8}$  K) regime in magnetic fields ranging from  $10^{-4}$  to  $10^4$  gauss. We also investigate the effect of the intra- and inter-molecular spin-spin interactions. A large number of resonances over many orders of magnitude are found in elastic and inelastic cross sections.

[1] Liesbeth M. C. Janssen, Gerrit C. Groenenboom, Ad van der Avoird, Piotr S. Żuchowski, and Rafał Podeszwa, J. Chem. Phys. **131**, 224314 (2009).

Gerrit Groenenboom  
Radboud University Nijmegen

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