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Accumulating NH molecules in a magnetic trap STEVEN HOEKSTRA[1], FABIAN GRÄTZ, JENS RIEDEL, WOLFGANG JÄGER, GERARD MEIJER, Fritz-Haber-Institute, Berlin, Germany — We work on the trapping of stark-decelerated neutral molecules. In the last few years we have electrostatically trapped OH and OD, metastable NH and metastable CO molecules. We have investigated trap loss mechanisms, and found that room-temperature blackbody radiation is a limiting factor for the trapping time, which is typically a few seconds. If the molecule is decelerated and trapped in a state that is short-lived compared to the trapping time, the metastable-state lifetime can be accurately obtained from the observed fluorescence decay.
Currenty we aim to increasing the density of the trapped NH molecules. The decelerated NH($a^1\Delta$) molecules can be optically pumped to the electronic ground state. A magnetic trap is used to trap the produced groundstate molecules. Since the groundstate is decoupled through a spontaneous emission step from the metastable state, this scheme enables a phase-space increase by accumulating multiple packets of Stark-declerated molecules. We will present our results on the reloading of NH using a trap made of permanent magnets.

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