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Multistage Zeeman deceleration A.W. WIEDERKEHR, S.D. HOGAN, M. ANDRIST, H. SCHMUTZ, B. LAMBILOTTE, F. MERKT, Laboratory of Physical Chemistry, ETH Zurich, Switzerland — In recent years multistage Zeeman deceleration of open shell atoms and molecules has been developed as a possible method to produce cold (< 1 K) samples for applications in precision spectroscopy and studies of cold reactive collisions [1-7]. This contribution will present the strategy followed at ETH Zurich which relies on (i) the generation of strong magnetic field pulses (> 2 T) with rise and fall times of only a few microseconds, (ii) the deceleration and loading of samples into quadrupole magnetic traps, (iii) 3D particle trajectory simulations of the complete deceleration and trapping processes, and (iv) comparison of the simulations with measurements of the velocity and spatial distributions of the decelerated and trapped samples. The four generations of Zeeman deceleration and trapping devices developed in our group will be presented and compared using results obtained with different samples.
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