Abstract Submitted
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Developing Density for Collisional Experiments with Ultracold Molecules Using a Magnetic Injector/Accumulator[1] JOE VELASQUEZ, III, SRIDHAR LAHANKAR, PETER WALSTROM, MICHAEL DI ROSA, Los Alamos National Laboratory — A prerequisite to studying ultracold chemistry is achieving a sufficient collision frequency as facilitated by creating a high number density. In this poster we show that some of the basic concepts and components of particle injectors and accumulators used in accelerators can be exploited to generate dense ensembles of ultracold magnetic particles, including laser-cooled paramagnetic atoms *and* molecules. For example, particles will be injected in one magnetic state and stored in another, much like charge-exchange injection into accelerator storage rings, allowing the progressive growth in density. We test these concepts first with atoms in preparation for later work with molecules. Presently, the injector stage uses a magnetic field and optical pumping to switch the state and trajectory of laser-cooled atoms into the stored state and accumulator path. Particle tracking calculations, design, and experiments with the injection and accumulation of 7Li will be presented. Finally, we will present our preliminary results in laser cooling of CaH and efforts to implement an injector/accumulator for these ultracold molecules.

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