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Developing Density of Laser-Cooled Neutral Atoms and Molecules in a Linear Magnetic Trap JOE VELASQUEZ, III, PETER WALSTROM, MICHAEL DI ROSA, Los Alamos National Laboratory — In this poster we show that neutral particle injection and accumulation using laser-induced spin flips may be used to form dense ensembles of ultracold magnetic particles, i.e., laser-cooled paramagnetic atoms and molecules. Particles are injected in a field-seeking state, are switched by optical pumping to a field-repelled state, and are stored in the minimum-B trap. The analogous process in high-energy charged-particle accumulator rings is charge-exchange injection using stripper foils. The trap is a linear array of sextupoles capped by solenoids. Particle-tracking calculations and design of our linear accumulator along with related experiments involving ^{7}Li will be presented. We test these concepts first with atoms in preparation for later work with selected molecules. Finally, we present our preliminary results with CaH, our candidate molecule for laser cooling. This project is funded by the LDRD program of Los Alamos National Laboratory.

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