Abstract Submitted
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Robust Simulation of Neutral Atom Trapping for Minimal Degree of Freedom Mixing[1] YONGE LANGE SIMMONS, SAMUEL COOPER, ADAM BRANDT, ZAK BURKLEY, CORY RASOR, DYLAN YOST, Colorado State University — Laser cooling is a strong candidate for decreasing systematic error in precision spectroscopy of hydrogen. This talk outlines a method for simulating neutral atoms in magnetic traps, guides, and lenses for validating designs for confining atomic hydrogen and reducing degree of freedom mixing during laser cooling. Our simulation method takes advantage of two techniques. The first being accuracy of boundary element analysis (ESRF's Radia) to calculate permanent magnet and current source magnetic fields. The second is the computational speed of numerical methods including interpolation and a symplectic integrator. The later of which performs well in energy conservation, which is ideal for determining the degree of freedom mixing over long time scales in a neutral atom trap.

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