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Progress towards measuring the Rydberg constant with circular Rydberg atoms ANDIRA RAMOS, KAITLIN MOORE, GEORG RAITHEL, University of Michigan — An experiment to measure the Rydberg constant independently of nuclear-charge effects, such as the currently ambiguous proton-size puzzle, is underway. Cooled and trapped circular rubidium Rydberg atoms will be utilized for the measurement. These states, obtained by using the adiabatic rapid passage method (ARP), have the advantages of having lifetimes in the order of milliseconds, small QED corrections, and no ionic-core and nuclear-charge overlaps. The transition of interest will be driven via amplitude modulation of a three-dimensional standing-wave light field the atoms are immersed in, which results in a Doppler-free spectroscopic signal. In this poster, we discuss the design and construction of the circularization, field control and lattice schemes for this experiment.

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