Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Ytterbium Rydberg atom arrays SAMUEL SASKIN, JACK WILSON, JEFF THOMPSON, Princeton University — Neutral atoms in optical tweezers are an attractive platform for both quantum computation and simulating quantum many-body physics, because of the combination of single site control and long range interactions via Rydberg excitations. While such systems have previously been explored in alkali atoms, the electronic structure of alkaline earth atoms, such as Yb, presents several advantages. These include long-lived nuclear spin states ($I = 1/2$ in ^{171}Yb), and improved cooling and state manipulation using the narrow intercombination line. I will discuss the features of individual Yb atoms in an optical tweezer array, as well as our progress towards the design and construction of such a system. Our ongoing efforts are aimed at spectroscopy of Yb Rydberg levels, trapping Yb atoms in optical tweezers, and characterization of single-atom manipulation and measurement techniques.

Samuel Saskin
Princeton University

Date submitted: 26 Jan 2018 Electronic form version 1.4