Photoassociation of Fermionic $^{87}\text{Sr}$ via the $^1S_0 - ^1P_1$ Transition

JOSHUA HILL, JAMES AMAN, THOMAS KILLIAN, Rice University — The fermionic isotope of strontium, $^{87}\text{Sr}$, is of interest for the development of optical frequency standards and the study of quantum many-body phenomena. In many of these experiments, $^{87}\text{Sr}$ is confined in an optical lattice. Detecting the presence of doubly occupied lattice sites is a valuable tool for studies of atomic gases in optical lattices, and this is typically done with photoassociation, in which two ground-state atoms in a scattering state are photo-excited to a molecular state. No resonance frequencies have been reported for transitions to molecular states of any excited electronic potential for $^{87}\text{Sr}$. Here we present results for photoassociation of $^{87}\text{Sr}$ atoms via the $^1S_0 - ^1P_1$ transition at 461nm ($\Gamma = (2\pi + 30.5)\text{s}^{-1}$), and measurements of optical lengths for select photoassociation spectra.