Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Angle-and-time resolved photoionization of neutral Rydberg wave packets in Argon[1] ALEXANDER PLUNKETT, DAKOTA WALDRIP, Univ of Arizona, CHRIS H. GREENE, Purdue University, ARVINDER SANDHU, Univ of Arizona — We studied dynamics of spin-orbit split Rydberg wave packets in Argon and conducted multi-channel quantum defect analysis of the ionization pathways. Using extreme ultraviolet attosecond pulse trains, we excite a Rydberg wavepacket in Argon and ionize it with a delayed IR probe pulse to produce photoelectrons that are analyzed in a time and angle resolved fashion with a velocity map imaging spectrometer. We focus on two ionization channels, corresponding to the spin-orbit split ionic ground state. We observed quantum beating in each channel with distinct phase relationship between the two channels. The time-evolution of energy dependent angular distributions is also analyzed. Experimental results are compared with multichannel quantum defect theory calculations to highlight the importance of many-electron interactions in photoionization.

[1]This work was supported by National Science Foundation under award 1912455.

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Date submitted: 29 Jan 2020 Electronic form version 1.4