Phase-dependent ionization suppression in atoms and molecules
DAVID B. FOOTE, JANE LEE, GUAN-YEU CHEN, WENDELL T. HILL, III,
University of Maryland, College Park — Evolving methods in ultrafast laser pulse
shaping allow a more complete investigation into the role of both the carrier enve-
lope phase (CEP) and chirp in quantum control experiments. Recent investiga-
tions suggest that phase is one of the key parameters in quantum control mechanisms. To
reveal the nature of the role phase plays we have employed a phase-only spatial light
modulator (SLM) to shape 800 nm, sub-60 fs transform-limited pulses into a pair of
transform-limited pulses (∼ 60 fs) where the relative phase and temporal separation
can be adjusted independently. At a fixed temporal separation, approximately three
times the pulse width, the ionization signal was measured as the phase was varied
over $2\pi+$. The ionization signals show a periodic dependence on the phase; at spe-
cific phase values the second pulse was rendered impotent, leading to an ionization
suppression in both atomic and molecular systems. When the temporal separation
was adjusted, a propensity for the relative phase between the two carriers to remain
fixed was observed. This suggests that the phase difference could be responsible for
“trapping” population in states inaccessible to ionization. These results and their
implication will be presented in this poster.

David Foote
University of Maryland, College Park

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