Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

**Attosecond spectroscopy of band-gap dynamics excited by the electric field of light** MARTIN SCHULTZE, Department of Chemistry, UC Berkeley / Fakultaet fuer Physik, LMU Muenchen, KRUPA RAMASESHA, DANIEL M. NEUMARK, STEPHEN R. LEONE, Department of Chemistry, UC Berkeley —
The basis of modern electronics and information processing is the control of the electric properties of semiconductors with microwave fields. Speeding up electronics requires extending this control to optical frequencies. We apply attosecond solid state spectroscopy to investigate and compare light field induced ultrafast carrier dynamics in a prototypical semiconductor (silicon) and dielectric ($SiO_2$). After excitation by a highly intense few-cycle visible laser pulse, a time-delayed extreme ultraviolet attosecond pulse centered around the Silicon L-edge transition maps the conduction band population and thus probes the unfolding electronic dynamics with sub femtosecond resolution. While the induced changes in $SiO_2$ appear only in the presence of the strong light field, the experiment on silicon measures a permanent population transfer into the conduction band triggered by the electric field of light as well as ultrafast renormalization of the band structure.

Martin Schultze
Department of Chemistry, UC Berkeley /
Fakultät für Physik, LMU München

Date submitted: 15 Nov 2013 Electronic form version 1.4