Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Bulk and surface contributions to high-harmonic generation in solids[1] FRANCISCO NAVARRETE, UWE THUMM, Kansas State University — While the generation of high-harmonics (HH) from gaseous atoms is well understood [1], HH generation from solids is discussed theoretically for decades [2], still debated [3, 4], and scrutinized experimentally only recently [3]. We investigated the field-strength and carrier-envelope-phase dependence of HH generation by the interaction of intense mid-infrared few-cycle laser pulses with Au, SiO_2, and ZnO, for which experimental data exists [3]. We numerically solved the time-dependent Schrödinger equation in one spatial dimension to analyze bulk and surface effects within a basis-set-expansion approach that allows us to (i) perform many steps of the calculation analytically and (ii) tune band-structure parameters of the solid to the valence-electronic structure of the solids. [1] A.-T. Le, *et al.*, Phys. Rev. A **80**, 013401 (2009). [2] L. Plaja and L. Roso-Franco, *Phys. Rev. B* **45**, 8334 (1992). [3] S. Ghimire *et al.*, *Nat. Phys,* **7**, 138 (2011); M. Wu, *et al.,* Phys. Rev. A **91**, 043839 (2015) [4] G. Vampa, *et al. Phys. Rev. Lett,* **113**, 073901 (2014).

[1]Supported by the US DoD AFOSR.

Uwe Thumm
Kansas State University

Date submitted: 06 Feb 2018 Electronic form version 1.4