Abstract Submitted
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Attosecond time–resolved streaked photoemission from solids[1]
QING LIAO, UWE THUMM, Kansas State University — We established a quantum-mechanical model for infrared (IR) laser streaked photoelectron (PE) emission from metal solids by an ultrashort extreme ultraviolet (XUV) pulse [1]. Special emphasis was laid on the influence of the energy dispersion of PEs inside the solids on the photoemission time delay. We first applied this model to Mg(0001) surfaces, assuming free–electron dispersion and found good agreement with measured streaked PE spectra and streaking time delays [2,3]. Next, we investigate W(110) surfaces for which non–free PE dispersion must be included in order to reproduce the measured photoemission delays at different XUV central photon energies. Our model reproduces a series of measured streaked spectrograms and photoemission delays for different metal solids, including clean Mg(0001) and W(110) surfaces and Mg-covered W(110) surfaces. It incorporates modeling of the target band structure, electron mean free paths [3], energy dispersion, and screening of the IR laser field on the surface.

[1] U. Thumm, et al., in: Handbook of Photonics 1: "Attosecond physics," ed. D. L. Andrew, ISBN:978-1-118-22553-0 (Wiley, 2015).
[2] Q. Liao and U. Thumm, Phys. Rev. Lett. 112, 023602 (2014).
[3] Q. Liao and U. Thumm, Phys. Rev. A 89, 033849 (2014).

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Uwe Thumm
Kansas State University

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