Abstract Submitted
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Attosecond time-resolved streaked photoemission from Mg–covered W(110) surfaces[1] QING LIAO, UWE THUMM, Kansas State University — We formulate a quantum-mechanical model [1,2] for infrared-streaked photoelectron emission by an ultrashort extreme ultraviolet pulse from adsorbate–covered metal surfaces. Applying this numerical model to ultrathin Mg adsorbates on W(110) substrates, we analyze streaked photoelectron spectra and attosecond streaking time delays [3] for photoemission from the Mg/W(110) conduction band and Mg(2p) and W(4f) core levels. Based on this analysis, we propose the use of attosecond streaking spectroscopy on adsorbate–covered surfaces with variable adsorbate thickness as a method for investigating (a) electron transport in condensed-matter systems and (b) metal–adsorbate–interface properties at subatomic length and time scales. Our calculated streaked photoemission spectra and time delays agree with recently obtained experimental data.

[1] Q. Liao and U. Thumm, Phys. Rev. Lett. 112, 023602 (2014).
[2] Q. Liao and U. Thumm, Phys. Rev. A 89, 033849 (2014).
[3] U. Thumm, Q, Liao, E. M. Bothschafter, F. Süßmann, M. F. Kling, and R. Kienberger, in: Handbook of Photonics 1: "Attosecond physics," ed. D. L. Andrew, ISBN:978-1-118-22553-0, Chapter XIII: "Attosecond streaking spectroscopy of atoms and solids" (Wiley, January 2015).

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