

Abstract Submitted
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Thickness-dependent attosecond streaking time delays in photoemission from magnesium adsorbate layers¹ QING LIAO, KAI LIU, MEIYAN QIN, PEIXIANG LU, Wuhan Institute of Technology, UWE THUMM, Kansas State University — We analyze the film-thickness dependence of streaking time delays that are accumulated during photoelectron emission from magnesium valence band (VB) and $2p$ core-level (CL) states. Our quantum-mechanical model [1] predicts that streaked photoemission time delays of VB photoelectrons are almost independent of the film thickness, while those of $2p$ CL photoelectrons are sensitive to the film thickness below ~ 100 monolayers (MLs) and increase by ~ 20 attoseconds as the thickness grows from 20 to 200 MLs [2]. We attribute the different streaking-time-delay dependence on the film thickness for VB and $2p$ CL photoemission to different degrees of wave-function localization of the initial bulk and surface states. [1] Q. Liao and U. Thumm, Phys. Rev. Lett. **112**, 023602 (2014); Phys. Rev. A **89**, 033849 (2014); Phys. Rev. A **92**, 031401(R) (2015). [2] Q. Liao, K. Liu, M. Qin, P. Lu, and U. Thumm, submitted.

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