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Multi-atom resonant photoemission effects in O 1s emission from metal oxides (NiO, CuO, and Cu₂O) and N 1s emission from an adsorbate (N₂/Ni(111))

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We will discuss recent experimental and theoretical results for interatomic resonant photoemission, often referred to as multi-atom resonant photoemission (MARPE) [1,2]. Clear MARPE effects are observed in O 1s emission from the metal oxides NiO, CuO, and Cu₂O as photon energy is scanned through the transition-metal 2p edges, in good agreement with resonant x-ray optical theory. For N₂ adsorbed on Ni(111), the N 1s intensity also shows a MARPE signature as photon energy is scanned over the Ni 2p edges, again in agreement with x-ray optical theory [3]. Possible local-field corrections to theory, the influence of varying radiation polarization, and implications of such effects for surface, nanostructure, and free-molecule studies will also be discussed. Work supported by U.S. Department of Energy, Contract No. DE-AC03-76SF00098. [1] F. J. Garcia de Abajo, C. S. Fadley, and M. A. Van Hove, Phys. Rev. Letters **82**, 4126 (1999). [2] A. W. Kay, F. J. Garcia de Abajo, S.-H. Yang, E. Arenholz, B. S. Mun, N. Mannella, Z. Hussain, M. A. Van Hove, and C. S. Fadley, Phys. Rev. B **63**, 115119 (2001). [3] P. Feulner, M. Ecker, P. Jakob, K. Kostov, R. Romberg, R. Weimar and D. Menzel, A. Föhlisch, W. Wurth, S.-H. Yang and C. S. Fadley, to be published.