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Characterization of induced nanoplasmonic fields in time-resolved photoemission from gold nanospheres: a classical trajectory approach[1]
ERFAN SAYDANZAD, UWE THUMM, Kansas State University — Attosecond time-resolved (XUV-pump, IR-probe) spectroscopy has been shown to be a powerful method for investigating the electron dynamics in atoms, and this technique is now being transferred to the investigation of electronic excitations, electron propagation, and collective electronic (plasmonic) effects in solids [1,2]. Based on classical trajectory calculations, we simulated (i) the final photoelectron velocity distribution in order to provide observable velocity-map images for gold nanospheres of 10 and 100 nm diameter and (ii) streaked photoemission spectra. By analyzing our numerical results, we illustrate how spatio-temporal information about the sub-IR-cycle plasmonic and electronic dynamics is encoded in velocity-map images and streaked photoelectron spectra. [1] "Attosecond physics: attosecond streaking spectroscopy of atoms and solids", U. Thumm, Q. Liao, E. M. Bothschafter, F. Süßmann, M. F. Kling, and R. Kienberger, p. 387, Handbook of Photonics, Vol. 1, (Wiley, 2015). [2] "Attosecond time-resolved streaked photoemission from Mg-covered W(110) surfaces", Q. Liao and U. Thumm, Phys. Rev. A 92, 031401(R) (2015).

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