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Temporal symmetries in XUV+IR photoionization RENATA DELLA PICCA, Centro Atómico Bariloche (CNEA) and CONICET, Bariloche, Argentina, MARCELO CIAPPINA, ICFO-The Institute of Photonic Sciences, Barcelona, Spain, DIEGO ARBÓ, Institute for Astronomy and Space Physics IAFE (UBA-CONICET), Buenos Aires, Argentina — The laser-assisted XUV photoelectric effect (LAPE) occurs when extreme ultraviolet (XUV) and infrared (IR) lasers overlap in space and time. The simultaneous absorption of one high-frequency photon and the exchange of several additional photons from the IR field, lead to equally spaced sideband (SB) peaks in the photoelectron spectra (PES) [1]. It is known that the temporal symmetry of the IR field is the responsible of the SB formation [2]. We have found, however, an additional symmetry in certain configurations (inherent to each half cycle) that gives rise to a destructive interference, resulting in only odd or even number of exchanged IR photons [3]. In the present work we theoretically investigate the LAPE in Ar $3s$, with an emphasis on the analytic properties deduced from the SFA transition matrix element. We show that, in several XUV+IR configurations, the PES can be described as a function of the time integral during the first IR optical cycle, not only for the sidebands but also (i) in the streaking regime and (ii) in the case for several XUV attosecond pulses [4]. [1] Véniard V et al 1995 Phys. Rev. Lett. 74 4161 [2] Gramajo A A et al 2018 J. Phys. B 51 055603 [3] Della Picca R et al 2020. J Phys Conf. Series. In press. [4] Della Picca R et al 2020. In preparation

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