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Quantum phaseshifts and Wigner-Smith time delays in the photoionization versus radiative recombination of Ar valence electrons<sup>1</sup> MAIA MAGRAKVELIDZE, Northwest Missouri State University, GOPAL DIXIT, MBI, Berlin, Germany, MOHAMED MADJET, QEERI, Doha, Qatar, HIMADRI CHAKRABORTY, Northwest Missouri State University — Using a methodology of time-dependent local density approximation (TDLDA) [1] with the Leeuwen and Baerends exchange-correlation functional, the quantum phases of the amplitudes of photoionization (PI) and its inverse process of radiative recombination (RR) for various dipole channels of Ar have been calculated [2]. Energy differentials of the phases, the so called Wigner-Smith time delays, for processes involving valence 3p and 3s electrons are considered. TDLDA 3p recombination phases are found to concur well with the recent experiment [3]. Effects of electron correlations have been studied and diagnosed in the framework of dynamical coupling between degenerate configurations. Differences in the phase and delay structures between PI and RR are found in general with dramatic distinctions at resonances and Cooper minima in particular.

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[3] S. B. Schoun, R. Chirla, J. Wheeler, C. Roedig, P. Agostini, L. F. DiMauro, K. J. Schafer, M. B. Gaarde, arXiv:1310.7008 [physics.atom-ph].

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