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**Strong-field ionization inducing multi-electron-hole coherence probed by attosecond pulses** JING ZHAO, JIANMIN YUAN, ZENGXIU ZHAO, National University of Defense Technology — Recent advances in attosecond spectroscopy has enabled resolving electron-hole dynamics in real time [1]. The correlated electron-hole dynamics and the resulted coherence are directly related to how fast the ionization is completed. How the laser-induced electron-hole coherence evolves and whether it can be utilized to probe the core dynamics are among the key questions in attosecond physics or even attosecond chemistry. In this work, we propose a new scenario to apply IR-pump-XUV-probe schemes to resolving strong field ionization induced and attosecond pulse driven electron-hole dynamics and coherence in real time. The coherent driving of both the infrared laser and the attosecond pulse correlates the dynamics of the core-hole and the valence-hole which leads to the otherwise forbidden absorption and emission of XUV photon. An analytical model is developed based on the strong-field approximation by taking into account of the essential multielectron configurations. The emission spectra from the core-valence transition and the core-hole recombination are found modulating strongly as functions of the time delay between the two pulses, which provides a unique insight into the instantaneous ionization and the interplay of the multi-electron-hole coherence. (arXiv: 1510.07947 (2015))

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