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Quantum beats in attosecond time-resolved autoionization of krypton[1] YAN CHENG, MICHAEL CHINI, University of Central Florida, XIAO-MIN TONG, University of Tsukuba, ANDREW CHEW, University of Central Florida, JULIUS BIEDERMANN, Friedrich-Schiller Universität, YI WU, ERIC CUNNINGHAM, ZENGHU CHANG, University of Central Florida — The recent development of attosecond transient absorption spectroscopy (ATAS) has allowed probing of electron dynamics in atoms with few-femtosecond to sub-cycle time scales. Recently, the contribution of quantum beating to the two-color multi-photon excitation process has been proposed and demonstrated in the attosecond transient absorption experiment in the bound state of atoms. Here we performed an attosecond transient absorption experiment with krypton atoms, the attosecond pulse launched electronic wave packets composed of multiple bound excited states and spin-orbit coupling induced autoionization states of krypton atoms. Quantum beats were observed in the autoionizing states near the ionization threshold. Recurrences were observed in the $4s^24p^5(^2P^\circ_{1/2})6d$, $4s^24p^5(^2P^\circ_{1/2})7d$, $4s^24p^5(^2P^\circ_{1/2})8d$ states with periods of 5 – 10 fs. The relative phase among these autoionizing states can be retrieved from such measurement, thus allowed the reconstruction of the valence state wave packets.

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