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Carrier-Envelope Phase Effects in Multi-Photon Procesess PANKAJ JHA, Texas A&M University, YURI ROSTOVTSEV, University of North Texas, HEBIN LI, VLADIMIR SAUTENKOV, Texas A&M University, MARLAN SCULLY, Texas A&M University and Princeton University — We present an experimental and theoretical study of the carrier- envelope phase (CEP) effects in multi-photon excitation process between two bound atomic states interacting with intense pulses consisting of many cycles (up to 15 cycles) of the field. Radio frequency pulses with Rabi frequency of the order of the atomic transition frequency are used to transfer population among the ground state hyperfine levels in rubidium atoms. We have found that, for long pulses consisting two frequencies, the CEP of the pulses strongly affects that transfer. Extending the CEP control to longer pulses creates interesting possibilities to generate pulses with accuracy that is better than a period of laser oscillation.

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