

Abstract Submitted
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Experimental Observation of Carrier-Envelope Phase Effects in Multi-Cycle Pulses¹ PANKAJ JHA, Texas A&M University, YURI ROSTOVTSSEV, University of North Texas, HEBIN LI, VLADIMIR SAUTENKOV, Texas A&M University, MARLAN SCULLY, Texas A&M University and Princeton University — Using intense RF pulses interacting with the magnetic Zeeman sub-levels of Rubidium (Rb) atoms, we have experimentally and theoretically shown the CEP effects in the population transfer between two bound atomic states interacting with pulses consisting of many cycles (up to 15 cycles) of the field. It opens several exciting applications and interesting possibilities that can be easily transfer to optical range and enhance current and create new set of tools to control CEP of laser pulses. These tools allow researchers to improve laser systems that generate laser pulses with better reproducibility and accuracy and better controlled. Also the tools provide an additional handle to control the process of collisions, and the current approach of extending the duration of the pulses with measurable or controllable CEP allows researchers to extend the coherent control to a new level where they are able to study molecular collisions or electron collisions in nano-structures under the action of strong electromagnetic fields with known CEP. In particular, the obtained results can be applied to control of chemical reactions.

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Pankaj Jha
Texas A&M University

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