

Abstract Submitted
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Enhanced carrier-envelope phase effect in photoexcitations of alkali atoms¹ FATIMA ANIS, B.D. ESRY, J. R. Macdonald Laboratory, Department of Physics, Kansas State University — A carrier-envelope phase (CEP) effect has recently been predicted in the photoexcitation of Cs [1]. Although interesting, the effect found in [1] is unfortunately very weak and likely to be inaccessible to experimentalists. With the hope of finding a larger effect, we have performed a series of calculations for Li, Na, K, Rb, and Cs. Among these atoms, Na is the most promising candidate for CEP effect in photoexcitation. In particular, we found a strong modulation of about 80 percent in the excitation probability as a function of CEP for the 3p and 3d states at a peak intensity of about 8×10^{12} W/cm². We have seen a modulation of more than five percent along with more than five percent population in many other states for these alkali atoms as well. The CEP effects are generally larger for Li and Na than for Rb and Cs. We hope that finding a bigger modulation in a strong signal will make it possible to observe the effect experimentally.

[1] T. Nakajima and S. Watanabe, Phys. Rev. Lett. **96**, 213001 (2006).

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