

Abstract Submitted
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Unambiguous identification of quantum pathways in multiphoton dynamics¹ NORIO TAKEMOTO, B.D. ESRY, J.R. Macdonald Laboratory, Kansas State University — Understanding the dynamics of an atom or molecule exposed to ultrashort, intense laser pulses has long been a challenge. Even when the wave function—which, in principle, contains all such information—is available from a calculation, extracting the dynamical pathways can be very difficult. Moreover, there is no general prescription for doing so, requiring a new effort for each new problem. Even then, it is usually difficult to provide more than a qualitative definition. To try to address this situation, we will present a method to analyze both wave functions and observables that unambiguously—and quantitatively—defines quantum pathways labeled by both the total photon number and the net photon number. Our method is completely general in the sense that atoms and molecules of any complexity can be treated. We will examine the extent to which knowing the total and net photon numbers that interfere to produce a specific feature and how they do so enhances our understanding of the dynamics.

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