Abstract Submitted
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Ionization rates computed from classical periodic orbit theory[1]
KEVIN MITCHELL, University of California, Merced — We consider the ionization dynamics of a Rydberg atom in applied electric and magnetic fields, an inherently chaotic process which has served as an important laboratory model for both classical and quantum chaos. Such classically chaotic systems often decay exponentially over intermediate time scales, before turning over into an algebraic tail at long times. (The algebraic tail is due to residual "stickiness" of the regular, i.e. nonchaotic, region of the classical phase space.) We demonstrate how the intermediate exponential decay rate can be directly computed from the classical periodic orbits of the electron. This computation requires a detailed knowledge of the chaotic electron dynamics, made possible by recently developed theoretical tools.

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