Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Ionizing Kicked Hydrogen with Homoclinic Tangles KORANA BURKE, KEVIN MITCHELL, University of California Merced — A kicked hydrogen atom subjected to alternating periodic forcing by an external electric field exhibits chaotic behavior. We study the geometry of homoclinic tangles that arise in phase space and use the knowledge we gain from the transport of the charged particle through a "turnstile" to draw conclusions about the ionization rate. We apply both delta function and square-shaped alternating kicks to the charged particle. In order to study the escape rate we form the initial conditions by populating an energy eigenstate or a minimum uncertainty wavepacket. We examine the lobe dynamics and give conclusions about how the size and shape of the lobes influence the phase space transport. The classical calculations can be applied to the study of ionization rates of highly excited Rydberg atoms.

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Date submitted: 05 Feb 2007 Electronic form version 1.4