

Rydberg Atoms in External Fields

Correlated Level-Crossing and Classical Transport. J. E. BAYFIELD, L. C. PEROTTI, Univ. of Pittsburgh.---Stueckelberg oscillations in transition probabilities have been observed for highly excited hydrogen atoms in collinear pulsed microwave and steady static electric fields [1]. The onsets and periods of the oscillatory variation with peak microwave field strength depend primarily on the scaled microwave frequency and fields, which are classical parameters. Experimentally and numerically we find that the oscillation onsets correlate with onsets for a change in the final bound state distribution from a single peak to a double peak. Classically the second peak is found to arise from the transport of probability in phase space from one branch of a separatrix region to the other [2].

[1]. J. E. Bayfield, S.-Y. Luie, B.A.P.S. 38, 1108 (1993).

[2]. K. Dietz et al, Phys. Rev. A 45, 4960 (1992).