Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Photoinitiated decomposition of hydorxyalkyl radicals: Rydberg-valence interactions HANNA REISLER, JIE WEI, BORIS KARPICHEV, LAURA EDWARDS, University of Southern California — The photoinitiated dynamics of hydroxyalkyl radicals is investigated on the ground and excited surfaces. Overtone excitation of four quanta of OH stretch vibration of the hydroxymethyl radical gives rise to O-H bond fission via tunneling, without prior isomerization to the methoxy radical. Excitation of hydroxyethyl radicals to the lowest s and p Rydberg excited states accesses dissociative states lying as low as 2.5 eV above the ground state. These states undergo conical intersections with each other and the ground state, which are much more efficient than comparable interactions in the hydroxymethyl radical, and display increased opportunities for accessing crossing seams. Both O-H and C-H bond fission channels are observed. Dissociation mechanisms involving direct and indirect bond fission, isomerization and nonadiabatic interactions will be discussed. Research supported by DOE.

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Date submitted: 23 Nov 2005 Electronic form version 1.4