ANOMALOUS Q BRANCH INTENSITY IN THE 2+1 REMPI SPECTRUM OF THE $^1\Pi$-$^1\Sigma^+$ TRANSITION IN HIGHLY ROTATIONALLY EXCITED CO PHOTOFRAGMENTS FROM OCS PHOTODISSOCIATION AT 215 NM

CAROLYN E. GUNTHARDT, COLIN J. WALLACE, *Department of Chemistry, Texas A & M University, College Station, TX, USA*; GREGORY HALL, *Division of Chemistry, Department of Energy and Photon Sciences, Brookhaven National Laboratory, Upton, NY, USA*; SIMON NORTH, *Department of Chemistry, Texas A & M University, College Station, TX, USA*.

Nascent CO (X $^1\Sigma^+$) photoproducts formed in the dissociation of OCS at 215 nm were probed using 2+1 resonance enhanced multiphoton ionization (REMPI) through the E $^1\Pi$ state. This photodissociation produces a highly rotationally excited CO distribution, with fragment rotational levels ranging from J=48 to J=77. The resulting REMPI spectrum contains a prominent Q branch, despite negligible line strength factors for high J, two-photon, Π-Σ, Q branch transitions. The presence of a Q branch in the spectrum is explained by intensity borrowing from the nearby C $^1\Sigma^+$ state, as coupling between the C and E states is well documented, and two photon, Σ-Σ, Q branch transitions are intense for high J states. The observed relative intensities of the Q and S branch lines are well described by extrapolation to high J of the J-dependent mixing of C and E states inferred from the E state lambda doublet splittings at lower J. Improved D_e and D_f constants have been derived through the incorporation of this high J data.