ELECTRONIC SPECTROSCOPY OF THE A$^1A'' - X^1A'$ SYSTEM OF DCF

H. FAN, I. IONESCU, C. TAO, M. DESELNICU, C. MUKARAKATE, AND S. A. REID, *Department of Chemistry, Marquette University, Milwaukee, WI 53233*; JU XIN, *Department of Physics and Engineering Technologies, Bloomsburg University, Bloomsburg, PA 17815*.

To further investigate the Renner-Teller effect and excited state barriers to linearity and dissociation in the simplest singlet carbene, HCF, we measured fluorescence excitation spectra and lifetimes of the pure bending levels 2_0^n and combination bands $1_0^1 2_0^n$ and $2_0^n 3_0^1$ in the A$^1A''$-X$^1A'$ system of the deuterated isotopomer, DCF. The spectra were measured under jet-cooled conditions using a pulsed discharge source, and rotationally analyzed to yield precise values for the band origins and rotational constants. The derived A$^1A''$ state parameters are compared with our previous results for HCF, and with the predictions of $ab\,initio$ electronic structure theory.