POLARIZATION QUANTUM BEAT SPECTROSCOPY OF THE A^1A'' STATE OF HCF AND DCF

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To investigate the ^{19}F and ^{1}H nuclear hyperfine structure, Zeeman effect, and spin-orbit interactions in the simplest singlet carbene, we recorded polarization quantum beat spectra (QBS) of $^{r}R_0(J)$ lines of the pure bending transitions 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 HCF and DCF. The spectra were measured under jet-cooled conditions using a pulsed discharge source, both at zero-field and under application of a weak magnetic field (< 30 G). Analysis yielded the nuclear spin-rotation constants (C_{aa}) and weak field Lande g_{aa} factors, from which the a hyperfine constants were estimated. The use of polarization QBS as a probe of spin-orbit interactions in this system will be highlighted.