STUDIES OF THE PREDISSOCIATED, QUASILINEAR B^1A' STATE OF $CH^{35}Cl$ AND $CD^{35}Cl$ BY OPTICAL-OPTICAL DOUBLE RESONANCE SPECTROSCOPY

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Last year at this meeting, we reported studies of the predissociated, quasilinear B^1A' state of fluorocarbene (CHF and CDF) using a fluorescence dip detected optical-optical double resonance technique via the A^1A'' state.[a] Recently, we have extended these observations to chlorocarbene, measuring OODR spectra of both $CH^{35}Cl$ and $CD^{35}Cl$. By recording OODR spectra of both isotopomers, we are able to pinpoint the origin of the B^1A' state, while lies near 22 400 cm^{-1}. In contrast to CHF, the B^1A' origin in chlorocarbene lies below the energetic threshold of the lowest dissociation channel, $C(^3P)$ + HCl. However, at higher energies several channels open up, including C-H and C-Cl bond fission, and the OODR spectra show significant lifetime broadening. Trends in the measured linewidths with energy will be discussed.

[a] C. Tao, S. A. Reid, T. W. Schmidt, and S. H. Kable, J. Chem. Phys. 125, 051105 (2007).