

# RELATIVE INTENSITY OF A CROSS-OVER RESONANCE TO LAMB DIPS OBSERVED IN STARK SPECTROSCOPY OF METHANE

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Last ISMS, we reported on Stark effects of the  $\nu_3$  band of methane observed with a sub-Doppler resolution spectrometer. We determined the rotation-induced permanent dipole moment (PEDM) in the vibrational ground state and the vibration-, rotation-, and Coriolis-type-interaction-induced PEDMs in the  $\nu_3 = 1$  state.

Figure illustrates Stark modulation spectrum of the  $Q(6)E$  with the external electric field of 31.0 kV/cm and the selection rule of  $\Delta M = \pm 1$ , where  $M$  is the magnetic quantum number. The  $\Delta M = 1$  and  $-1$  components of the Lamb dips labeled by  $A$  and  $B$  are resolved, and the central component  $C$  is identified with the cross-over resonance. The Lamb dips are assigned to the magnetic quantum numbers of the lower and upper states,  $(M'', M')$  according to the Clebsch-Gordan coefficients. We found that the relative intensity of the cross-over resonance to the associated Lamb dips depends on the  $P$ ,  $Q$ , and  $R$  branches. We ascribe the dependence to the collisional relaxation processes.

