VIBRATION-ROTATION-TUNNELING SPECTRUM OF FORMIC ACID DIMER IN THE 7.3µm REGION

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The vibration-rotation-tunneling spectrum of formic acid dimer, (HCOOH)$_2$, in the spectral region 1369-1375 cm$^{-1}$ has been measured by a multi-step rapid-can method in a slit jet expansion using a distributed-feedback quantum cascade laser. The observed spectrum is assigned to the O-C-H bending fundamental band. The tunneling splitting in the vibrational excited state is determined to be about 0.005 cm$^{-1}$, which is much smaller than that in the ground state, 0.0165 cm$^{-1}$ (Goroya et al., J. Chem. Phys. 140, 164311 (2014)). Strong local perturbations involving transitions with $J \geq 9$, $K = 0$ and 1 are identified in the observed spectrum. The deperturbation analysis will be presented.