MILLIMETER AND SUBMILLIMETER SPECTROSCOPY OF CHLORINE NITRATE: THE Cl QUADRUPOLE TENSOR AND THE HARMONIC FORCE FIELD

Holger S. P. Müller, *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109.*; Paul Helminger, *Department of Physics, University of South Alabama, Mobile, AL 36688*; Sidney H. Young, *Department of Chemistry, University of South Alabama, Mobile, AL 36688.*

The rotational spectrum of $ClONO_2$ has been (re-) investigated in the millimeter and submillimeter regions in the ground vibrational and first excited torsional states for both ^{35}Cl and ^{37}Cl isotopomers. A large number of a- and b-type R- and Q-branch as well as b-type P-branch transitions have been observed. This has enabled the improvement of the spectroscopic constants and the prediction of lines in the submillimeter region. Accidental near-degeneracies of rotational levels allowed the observation of a $\Delta J = 2$ transition and the precise determination of the off-diagonal quadrupole coupling constant χ_{ab}. The quartic distortion constants along with the vibrational wavenumbers and inertial defects have been used to calculate a harmonic force field. The results will be related to the molecular structure determined from an electron diffraction study and to data from related molecules such as Cl_2O.