THE THZ SPECTRUM OF GLYCOLALDEHYDE

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The vibration-rotation spectrum of the ν_1-0, ν_2-0 and ν_3-0 bands of glycolaldehyde was recorded up to 12 THz, using the far-infrared beamline AILES at the synchrotron SOLEIL and a Fourier transform spectrometer coupled to a multipass cell. More than eight thousands lines were assigned, revealing the rotation structure up to J=80, K_a=38 for the ground state. The THz data were fitted simultaneously with pure rotational transitions of better accuracy observed in the microwave (1), in the millimeter-wave (2) and in the sub-millimeter-wave (3) range. In addition new data were recorded at Lille in the 150-300 GHz and 750-950 GHz range. The THz lines and the microwave - (sub)-millimeterwave lines are reproduced with a standard deviation of 2 10^{-4} cm^{-1} and 40 KHz, respectively.
Glycolaldehyde has been identified toward the galactic center (4). The vibrational state partition function can be re-evaluated according to the bands origins associated with ν_1, ν_2, and ν_3, which are observed experimentally for the first time.
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