

## THE CO-DIMER: NEW STATES AND TUNNELING SPLITTING

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New extensive millimeter-wave measurements of the  $^{12}\text{C}^{16}\text{O}$  dimer have been made and more than 250 new spectral transitions have been observed in the frequency range of 80 - 135 GHz. Joint analysis of these and previous millimeter-wave data yielded in determination and precise location of 34 new energy levels of  $A^+$ -symmetry and 21 levels of  $A^-$ -symmetry. Some of them belong to already known stacks and others make up 9 new stacks of the dimer. These new energy levels are located at energies from 8 to  $18\text{ cm}^{-1}$  and in a free rotation limit they correspond to the states with  $(j_1, j_2, K) = (1, 1, 0), (1, 1, 1), (1, 1, 2)$  and  $(2, 0, 2)$ , where  $j$  is a rotational quantum numbers of the CO monomer and  $K$  is a projection of the total angular momentum on the intermolecular axis. One newly observed state of  $A^+$ -symmetry originating at  $12\text{ cm}^{-1}$  has  $K = 0$  and might be tentatively attributed to the lower tunneling component of the stretching vibration of the CO-dimer.

The tunneling splitting for many different states of two isotopic modifications of the dimer,  $(^{12}\text{C}^{16}\text{O})_2$  and  $(^{13}\text{C}^{16}\text{O})_2$  was determined, and its dependence on  $J$ -,  $K$ - values and on isotopic mass was studied. For some states the tunneling splitting increases in  $(^{13}\text{C}^{16}\text{O})_2$  as compared to  $(^{12}\text{C}^{16}\text{O})_2$ . Possible explanations of this anomalous behavior will be discussed.