



## **Analysis of the Near-Infrared Emissions of CO<sub>2</sub> in the Atmosphere of Venus**

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In this paper we analyze the daytime near-infrared emissions (1-5  $\mu\text{m}$ ) of CO<sub>2</sub> in the atmosphere of Venus. For that purpose we have:

- i) computed the populations of more than 60 vibrational levels of the four major isotopes of CO<sub>2</sub> in the atmosphere of Venus and used them as an input to the SMART (Spectral Mapping Atmospheric Radiative Transfer) code to compute the radiances in the atmosphere.
- ii) compared the results with satellite measurements.
- iii) computed the cooling/heating rates and estimated the relative contribution from the near-Infrared bands.

The results reveal that the consideration of Non-Local Thermodynamic Equilibrium effects is key for the appropriate interpretation of the Near-Infrared measurements in Venus and that these effects are much more important than in the Martian atmosphere, due to the larger relative abundance of atomic oxygen in the Venus' upper atmosphere.