

NON-LTE MODEL FOR INFRARED RADIATION IN THE MARTIAN ATMOSPHERE

A.A. Kutepov (*Max Planck Institute for Extrater. Phys.*), **W.C. Maguire**, **M.D. Smith**, **J.C. Pearl** (NASA/Goddard), **B.J. Conrath** (CRSR, Cornell), **A.G. Feofilov** (Univ. of Munich), **O.A. Gusev** (Univ. of Wuppertal)

We present a new model of the infrared radiation in the ro-vibrational bands of CO₂ and CO molecules in the Martian atmosphere. The model accounts for both vibrational and rotational non-LTE, line-overlapping effects, extinction due to dust particles, and absorption and transformation of the near-infrared solar radiation. It utilizes the "discontinuous finite element" radiative transfer algorithm and the accelerated lambda-iteration (ALI) technique. We demonstrate that this technique is far superior to matrix and conventional lambda iteration algorithms in minimizing computer time and storage and in converging much more rapidly. This allows efficient application of the model both (a) to the modeling and forward fitting of observations and (b) to estimation of the IR cooling/heating in the GCMs of the Martian atmosphere.