Simulations of selected O_2 airglow emissions in the Venus atmosphere

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In the Venus airglow observations, the (0_v') progression of the O_2 Herzberg II band is the most intense feature in the ultra-violet region; its peak intensity is ≈130 kR. The infrared atmospheric system is also present in the Venusian nighttime spectra. The latter emission is the strongest of all O_2 emissions with a maximum vertical intensity of ≈30 MR.

In light of the recent measurements from VIRTIS on board Venus Express and the detailed analysis of the spectra from Garcia Munoz, A. et al. (2009), I will present new simulations of O_2 emissions from the Herzberg II and Infrared Atmospheric bands using Venus atmospheric conditions. The model results are compared to the available observations to improve our understanding of the oxygen photochemistry and the fate of the oxygen species during the nighttime in a CO_2 atmosphere. The global distribution of these emissions is analysed to better understand the distribution of oxygen atoms in planetary atmospheres and its implication for the thermal budget of CO_2 atmospheres. The goal of the analysis is to improve our understanding of the thermal structure in the middle atmospheres of Venus and Mars.

Garcia Munoz, A. et al., Visible and near-infrared nightglow of molecular oxygen in the atmosphere of Venus, J. of Geophys. Res. - Planets, V109, E12002, 2009.