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# UV dayglow variability on Mars: simulation with a Global Climate Model and comparison with SPICAM/MEx data

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Remote sensing of UV atmospheric emissions has been used since the beginning of the space era to gain information about the temperature and composition of the upper atmosphere of Mars. The dayglow emissions arising from Mars are dominated by the CO Cameron bands and the $CO_2$+ UV doublet. These emission systems are ultimately produced by the effects of UV solar radiation and photoelectrons on $CO_2$, the main constituent of the Martian atmosphere. The UV channel of the SPICAM instrument on board Mars Express has been observing the Martian dayglow during 4 Martian Years.

Different theoretical models have been developed in order to simulate the Martian UV dayglow spectra. They are 1D models, meaning they only consider vertical variations. This allows for a detailed treatment of the different processes producing atmospheric emission, but strongly limits their ability to take into account the atmospheric variability produced by a variety of photochemical and transport processes.

We have included in the LMD Mars Global Climate Model (LMD-MGCM) a physical model of the Martian dayglow, naturally coupling the UV airglow and the atmospheric variability. Here we will present the comparison of the model predictions with the SPICAM dataset, and we will present the first global maps of the UV Martian dayglow. Differently to previous studies, we find a significant contribution of CO electron impact excitation to the Cameron bands. This finding suggests that the analysis of the scale height of this emission system to derive temperatures may be biased. The peak altitude of the emissions is well predicted by the model, and the effects of a global dust storm in the peak altitude is detected.

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