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# Modeling and observation of the CO Cameron bands in the upper atmosphere of Mars

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The CO($a^3\Pi$ - $X^1\Sigma^+$) emission bands, the Cameron bands, have been observed in the atmospheres of Mars and Venus for a long time. They are mainly produced by dissociation of the $CO_2$ molecules by photon and electron impacts.

The SPICAM spectrometer onboard Mars express was able to detect these bands by limb observation of the Martian UV airglow. We present here the comparison of these observations with the simulations of the Aeroplanets model (a photon and electron transport model, capable of computing the excited state species production and the resulting emissions; but also a forward model, able to retrieve the atmospheric parameters through model-simulation comparisons).

By carefully checking the uncertainties in the Aeroplanets model, we were firstly able to reassess the discrepancy between the different airglow models and the observations (as seen in Simon et al. 2009, Cox et al. 2010, Jain and Bhardwaj 2011). An examination of the sources of uncertainties showed that the division by three of the Cameron band production by electron impact on $CO_2$ cross section would solve the problem. This division by three is supported by laboratory reassessment of the Cameron band transition (Gilijamse et al 2007).

The improvement of the accuracy of the Cameron bands simulations gives perspectives on their use to derive key parameters of the neutral atmosphere such as the exospheric temperature, the scale height of $CO_2$, and their dependence on the solar longitude Ls.