

# MARS OXYGEN GREEN LINE DAYGLOW FROM NOMAD/UVIS AND MODEL COMPARISON

**L. Soret**, LPAP-STAR, Université de Liège, Belgium ([Lauriane.Soret@uliege.be](mailto:Lauriane.Soret@uliege.be)), **J.-C. Gérard**, LPAP-STAR, Université de Liège, Belgium, **L. Gkouvelis**, NASA Ames Research Center, CA, United States, **S. Aoki**, University of Tokyo, Japan, **B. Hubert**, LPAP-STAR, Université de Liège, Belgium, **and the NOMAD/UVIS team**

The UVIS (UV and Visible Spectrometer) channel of the NOMAD (Nadir and Occultation for Mars Discovery) spectrometer onboard the ExoMars Trace Gas Orbiter performs limb observations of the day-side of the Mars atmosphere in both the visible and the ultraviolet domains since April 2019.

The recently discovered visible emissions of the oxygen green line at 557.7 nm has here been investigated. The variations of the limb profile of this emission are studied over seasons (Figure 1). These average limb profiles are compared to photochemical model simulations with MAVEN/EUVM solar flux and the LMD GCM as inputs of the model. The global shape of the profile and the intensities are generally well reproduced. However, the peak altitude can sometimes be underestimated by the model and needs an adjustment of the CO<sub>2</sub> density to reproduce the observations.

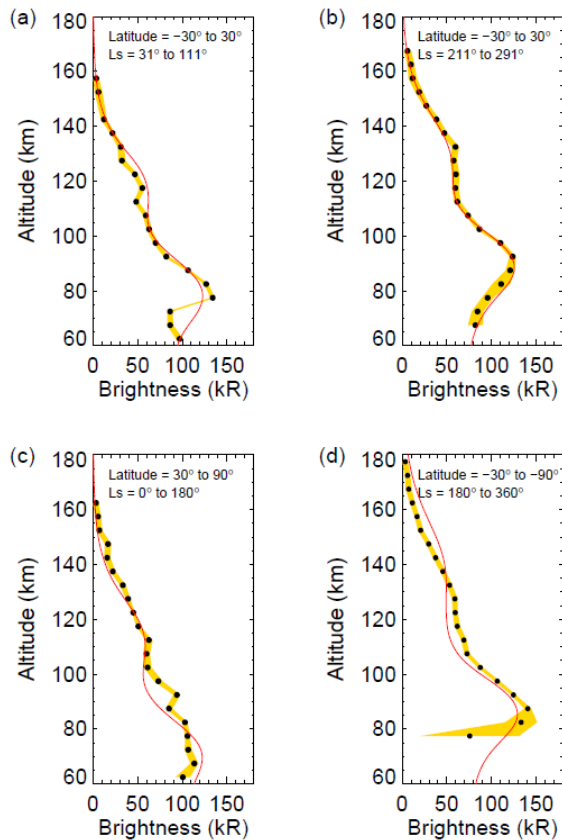


Figure 1: Seasonal variations of the oxygen green line (Soret et al., submitted)

We also compare the variations of the green line intensities over some individual UVIS limb tracking observations (observations of the atmosphere at a quasi-constant altitude) to model simulations and demonstrate a very good agreement (Figure 2).

Finally, we show that the intensity and altitude of the lower emission peak are correlated with the solar Ly- $\alpha$  flux as expected from the theory of its production.

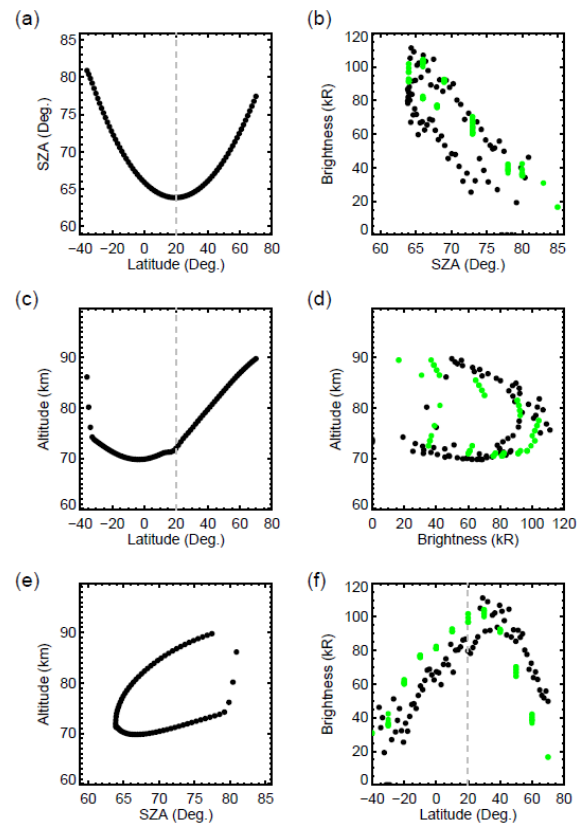


Figure 2: NOMAD/UVIS limb tracking observation acquired on the 2021/02/16 (black dots). Model simulations are shown with green dots. (Soret et al., submitted)