Mars Aurorae as seen by SPICAM on board Mars Express

F. LEBLANC¹, O. WITASSE², R. LIGI¹ AND P.-L. BLELLY³

 ¹LATMO, IPSL, Université Versailles Saint Quentin, Guyancourt, France, francois.leblanc@latmos.ipsl.fr
² Research and Scientific Support Department of ESA-ESTEC, The Netherlands ³ CESR, Toulouse, France

We present the last results on Martian aurora obtained by SPICAM UV spectrometer on board Mars Express (MEX). Several auroral emissions were identified on the Martian night side near crustal magnetic fields [1]. For most of these events coordinated observations with MARSIS and ASPERA-3 on board Mars Express were possible. ASPERA-3 is composed of an ion mass analyzer (IMA), of two neutral particle imagers (NPI and NPD) and of one electron spectrometer (ELS). For these particular events, data from the electron spectrometer were available so that a simultaneous measurement of the precipitating electron flux was possible. MARSIS is a multifrequency synthetic aperture orbital sounding radar which monitors in particular the Total Electron Content (TEC) and which was operating for some of these events. At the end, SPICAM UVS is a UV spectrograph covering the spectral range between 110 and 300 nm and which measures the atmospheric glow. This new set of observations shows quite strong coincidences between the occurrence of energetic precipitating electrons into the Martian atmosphere, the increase of the TEC, the presence of crustal magnetic field anomalies and auroral-type glow [1]. We have realized simulations using TransMars a 1D-model based on a coupling between kinetic and fluid codes adapted to Mars [2] to reproduce these different

References

 Leblanc F., Witasse O., Lilensten J., R. Frahm, Ali Safaenili, D. Brain, J. Mouginot, H. Nilsson, Y. Futaana, J. Halekas, M. Holmstrom, J.L. Bertaux, D. Winningham, W. Kofmann and R. Lundin, *Journal of Geophysical Research*, **113**, A08311, doi:10.1029/2008JA013033 (2008).

signatures. In this presentation, we will present the results of this work.

[2] Witasse O., O. Dutuit, J. Lilensten, R. Thissen, J. Zabka, C. Alcaraz, P.-L. Blelly, S. W. Bougher, S. Engel, L. H. Andersen, and K. Seiersen, *Geoph. Res. Let.*, 29, 104 (2002).