

UV-visible emissions in the atmosphere of Ganymede

G. Cessateur (2), **M. Barthelemy** (1), L. Mbemba-Kabiuku (1), J. lilensten (1)

(1) Institut de Planetologie et d'Astrophysique de Grenoble, France (2) PMOD/WRC, Davos, Swiss

Abstract

In the frame of the future JUICE mission, we began to calculate the emissions of the Ganymede atmosphere. After the effects of the solar UV flux, we investigate the effects of the magnetospheric electrons coming from the jovian magnetosphere into the Ganymede atmosphere.

1. Introduction

The JUICE mission will study the iced jovian satellites. Although these object have a very faint atmosphere, their exosphere can show some emissions features due to both solar UV flux and precipitating particles. We recently calculated the effects of the solar UV flux [1]. However, in the case of the polar region of Ganymede the precipitating electrons play an important role in the emission features as measured by [2] and [3] for the O 130 nm triplet.

2. Method

To calculate these emissions, we use the atmospheric model produced by [4]. We use a simple primary ionization calculation. This is justified by the fact that the atmosphere is essentially non collisionnal except at very low altitudes and latitudes.

For the solar UV flux, we used the configuration already explained in Cessateur et al. (2012). For the electrons, we used several type of spectrum. By comparison between the data of Feldman et al., we hope to constraint the electrons fluxes precipitating in the atmosphere of Ganymede.

3. Summary and Conclusions

These calculations give strong information on the processes involved in the Ganymede environment. In particular, we will be able to produce constraints on

the electrons spectrum precipitating in Ganymede atmosphere. This will also give important input for the preparation of the UV-visible instruments on board the JUICE mission.

References

- [1] Cessateur et al. Icarus, Volume 218, Issue 1, p. 308-319. 2012
- [2] Hall et al. Astrophysical Journal v.499, p.475, 1997
- [3] Feldman et al. Astrophysical Journal, v. 535, Issue 2, pp. 1085-1090, 2000.
- [4] Marconi, Icarus, Volume 190, Issue 1, p. 155-174, 2007.

