EPSC Abstracts,
Vol. 4, EPSC2009-40-1, 2009
European Planetary Science Congress,

The very busy auroral footprint of Ganymede

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Abstract

Ganymede is the only Galilean satellite having an internal magnetic field strong enough to carve its own mini-magnetosphere inside Jupiter's. Its interaction with Jupiter's fast rotating magnetospheric plasma gives rise to a current system producing an auroral footprint in Jupiter's ionosphere, usually referred to as the Ganymede footprint (GFP) (Figure 1). We analyzed 753 far-UV images obtained with the Hubble Space Telescope from 2000 to 2008 [1], showing the GFP wandering among the other components of Jupiter's complex aurora. The auroral footprint surface matches a circular region in Ganymede's orbital plane having a diameter of 8 to 20 RG. The auroral power emitted at the GFP ranges from ~0.2 GW to ~1.5 GW. Temporal analysis of the auroral power of Ganymede's footprint reveals variations characterized by three timescales: 5 hours, 10 to 40 minutes, and 100 s. We will discuss these variations in view of recent MHD modeling of Ganymede's interaction with the Jovian plasma [2].

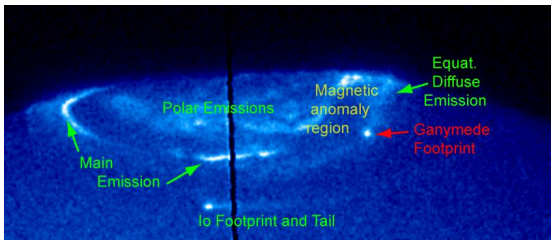

Figure 1: Raw HST/ACS image of Jupiter's northern hemisphere showing the auroral footprint of Ganymede near the magnetic anomaly region and the main components of Jupiter's FUV aurora.

References

[1] Grodent, D. et al. (2009) *JGR*, "The auroral footprint of Ganymede", *accepted for publication*, doi: 10.1029/2009JA014289.

[2] Jia, X. et al. (2008) *JGR*, *113*, A06212, doi: 10.1029/2007JA012748.