



Morphology of the Io footprint

B. Bonfond, J.-C. Gérard, and D. Grodent

University of Liège, Belgium (B.Bonfond@ulg.ac.be)

The electromagnetic interaction between Io and Jupiter's magnetic field leads to single or multiple ultraviolet spots a few degrees downstream from the feet of the Io flux tube. Inter-spot distance variations, as well as brightness fluctuations of the footprint on timescales of hours appear to be linked to the position of Io in the plasma torus. The work presented is based on an extensive dataset of UV auroral images of Jupiter obtained since 1997 with the STIS and ACS cameras on board the Hubble Space Telescope. Brightness variations on timescales of ~ 1 minute are studied and are probably induced by the acceleration mechanism close to Jupiter. Additionally, we present measurements of the footprint length, width, height and altitude. We also show unexpected morphological modifications of the footprint as a function of Io's position in the torus. Finally we discuss the possibility of local time influence on the footprint brightness. By characterising these physical parameters, we provide crucial inputs for the theoretical modelling of this complex phenomenon.