



Response of Jupiter's thermospheric flows to different magnetospheric conditions

Japheth Yates, Nicholas Achilleos, and Patrick Guio

Department of Physics and Astronomy / Centre for Planetary Sciences, UCL, United Kingdom (japheth.yates.09@ucl.ac.uk)

The magnetosphere-ionosphere coupling at Jupiter is known to play a central role in generating auroral emissions at this planet. The strength of these emissions is partly determined by the relative rotational flows in the upper atmosphere (thermosphere) and in the magnetodisc. We present simulations of the atmospheric flow which employ an azimuthally symmetric global circulation model. In order to make preliminary estimates of the effects of upstream solar wind conditions on these flows, we calculate models which assume different profiles of magnetic field and plasma angular velocity in the magnetodisc, corresponding to compressed and expanded states of the planet's magnetosphere. We use these simulations to comment on the relationship between global magnetospheric configuration and the global pattern of winds and energy inputs into the thermosphere. We comment on the procedure for obtaining solutions for the plasma angular velocity in the presence of an ionospheric conductance which is itself dependent on the field-aligned currents which flow between the ionosphere and the disc.