



Auroral current systems at Saturn and Jupiter

E. J. Bunce
Department of Physics and Astronomy, University of Leicester, LE1 7RH, UK (emma.bunce@ion.le.ac.uk)

Abstract

Since Cassini orbit insertion in 2004, we have gained a new understanding of Saturn's magnetosphere and auroral emissions through in situ and remote sensing observations from multiple instruments onboard the Cassini spacecraft (e.g. MAG, CAPS, MIMI, RPWS, ISS, UVIS, & VIMS), crucially supported by Earth-based telescope observations (e.g. the Hubble Space Telescope). In this review, the high-latitude measurements of the field-aligned current systems and plasma populations which are now being studied in situ at Saturn will be discussed generally, highlighting typical (and unusual) conditions. Such examples will be discussed, where possible, with auroral observations to aid their interpretation. Overall, the recent data from Saturn are both confirming and challenging our previous theoretical picture of the formation of auroral current systems there, and the main similarities and differences between the models and observations will be highlighted here. We also make comparisons to the main current systems operating in Jupiter's magnetosphere (as they are currently understood), and make some theoretical predictions using the orbits for the upcoming NASA Juno mission.