

Title: Charge exchange in Jupiter's aurorae

Abstract summary: This talk is focused on Jupiter and the role that ionic charge exchange has in producing the copious amounts of X-rays observed from its aurorae.

Abstract

Over the last decade especially XMM-Newton and Chandra have given impetus to X-ray studies of solar system bodies, which have revealed how ubiquitous X-ray emission is among planets, moons, comets and asteroids. A large fraction of this emission is due to charge exchange in the interaction of solar wind ions with atmospheric and exospheric neutrals around planets, and throughout the heliosphere.

This talk will focus on Jupiter and the role that ionic charge exchange has in producing the copious amounts of X-rays observed from its aurorae. The ultimate origin of the ions, which must be accelerated in the planet's magnetosphere in order to produce the observed X-ray fluxes, is still unclear: it could be in the solar wind, or from Io's volcanoes. Distinguishing between the two is difficult with the sensitivity and energy resolution of current observatories. However, high resolution spectra from the XMM-Newton RGS give a measure of the energy (a few MeV) of the oxygen ions undergoing charge exchange, which is consistent with the predictions of auroral models for the giant planet.