Geophysical Research Abstracts
Vol. 12, EGU2010-13227, 2010
EGU General Assembly 2010

Beam modelling of Io-controlled Jovian decameter radiation and localized active longitude

Patrick H. M. Galopeau (1) and Mohammed Y. Boudjada (2)

(1) Université Versailles St-Quentin; CNRS/INSU, LATMOS-IPSL, Vélizy, France (patrick.galopeau@latmos.ipsl.fr), (2) Space Research Institute, Austrian Academy of Sciences, Graz, Austria

Previous investigations by Galopeau *et al.* (*J. Geophys. Res.*, 2004, 2007) have shown that some specific Jovian active longitudes favour the Io-controlled Jovian decameter radiation. Supposing the emission is generated by the cyclotron maser instability (CMI) near the local gyrofrequency, along an active magnetic field line carried away by the satellite Io during its revolution around Jupiter, the authors explained why the occurrence probability is larger in some specific regions of the central meridian longitude (CML)-Io phase diagram. These regions correspond to the so-called Io-A, Io-B, Io-C and Io-D sources. Galopeau *et al.* showed that the growth rate of the waves, derived from the CMI, is larger in those source regions. In their model, the active magnetic field line is supposed to present a constant lead angle δ relatively to Io's position and the beaming of the radiation is an axi-symmetrical hollow cone characterized by a constant half-angle θ. Long term observations allow us to define accurate contours for the source regions (Io-A, Io-B, Io-C and Io-D) in the CML-Io phase diagram. The common active longitude range derived from these observational constraints leads to justify only part of the Io-controlled radiation. It is particularly evident for the southern sources Io-C and Io-D. In the present study, we report on the possibility for the emission cone not to be axi-symmetrical but to present an elliptical section, the major directions of which would be determined by both the magnetic field vector **B** and the gradient of the magnetic strength ∇B.