

Io-A Source Modulation Lanes in Jupiter's Decametric Radio Spectra

Kazumasa Imai[1]; Akihito Kawatake[2]

[1] Dept. of Electrical Eng., Kochi National College of Technology; [2] Advanced Course, Kochi National College of Technology

<http://jupiter.kochi-ct.jp/>

Frequency-time dynamic spectra of Jupiter's emission display a complex structure on several different time scales. One of the characteristic spectral patterns on a few seconds time scale is the modulation lanes, which were discovered by Riihimaa in 1968. we developed a model for the mechanism responsible for their production in which the free parameters have been adjusted to provide a very close fit with the observations. In our model, we propose the existence of a grid-like interference screen composed of field-aligned columns of enhanced or depleted plasma density located along the longitudinal direction near satellite Io's orbit. Recently we made a statistical analysis of Io-A source modulation lanes observed by Nancay Observatoty in France. The results of three event analysis suggest that the lead angle between Io flux tube and previously energized flux tube is changing from 20 to 0 degrees during the period of Io-A radio source event. After passing through 0 degree point the magnitude of radio emissions from Io-A source is usually fading out. This is very important information for the research of Jupiter's decametric radio emission mechanism.