

Propagation analysis of low latitude whistlers with equatorial plasma density structures

Yutaka Sawaki[1], # Toshio Matsuo[2]

[1] Electrical and Electronic Eng., Kyoto Univ, [2] Communications and Computer Eng., Kyoto Univ.

Low latitude whistlers (below 20 degree : magnetic latitude) on the ground is also thought to be duct propagation. But, to be trapped and propagate in duct, very high enhancement factor (about-400 percent) duct is required. As such high enhancement factor duct has not been reported, so we examined by ray tracing whether whistler mode waves without duct can observed on the ground or not. Propagation directions of whistler mode waves are strongly governed by magnetospheric plasma density structures and geomagnetic field configurations. When its gradients are large magnitudes, waves a strongly bent inwards or, outwards according to its polarities. So, we calculated the ray paths and wave normal directions by taking account of the equatorial anomaly and ion transition height by IRI model. Such density structures can make the wave normal directions of non-ducted whistler mode waves rotate and lie within the transmission cone.