

## Radiation Mechanism of Hybrid Tweek Wave

# kouji kawakita[1]

[1] Electrical Engineering, Fukui Univ. of Tech

Hybrid tweek wave radiated by the atmospherics is the electromagnetic wave phenomenon that can propagate in less than cut-off frequency to VLF range between the earth and the ionosphere. In this presentation, we have studied radiation mechanism of the hybrid tweek wave by using the data of long distance propagation from source point, and estimated the radiation region of the hybrid tweek wave that concentrate over the 0 degrees range in the magnetic declination and magnetic dip.

The author investigated about the radiation mechanism of the hybrid tweek wave by using the data observed at Awara observatory of Fukui Univ. of Tech. Hybrid tweek wave radiated by the atmospherics is the electromagnetic wave phenomenon that can propagate in less than cut-off frequency to VLF range between the earth and the ionosphere. we have studied radiation mechanism of the hybrid tweek wave by using the data of long distance propagation from source point, and estimated the radiation region of the hybrid tweek wave that concentrate over the 0 degrees range in the magnetic declination and magnetic dip. The F-T spectrum of VLF noise signals that observed at Awara station are obtained by a new wide-band and real-time spectrum analyzer that have develop at our observatory. By use of the numerical results of long distance propagation that is analyzed by the ray-path theory and distribution map of the weather satellite of GMS-5, we estimated the propagation distance of the hybrid tweek waves were approximately between 2500km to 6700km, and the signal source area was spread around Borneo, Indonesia and central Australia which are located the zero degrees regions in the magnetic declination and magnetic dip. And we investigated the field strength and the number of the hybrid tweek waves in distinction to geomagnetic disturbances. Also we found the occurrence characteristics about the number of the hybrid tweek wave that characteristics tend to increase with Q-days and tend to decrease with D-days. In consideration of stated above, we will analyze propagation characteristics about the horizontal direction in the lower ionosphere by using of Full wave analysis and Ray-tracing analysis.