

## Analysis of structure and movement of ionospheric disturbances by using scintillations of geostationary satellite

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[http://ssro.ee.uec.ac.jp/lab\\_tomi/index\\_j.html](http://ssro.ee.uec.ac.jp/lab_tomi/index_j.html)

We have analyzed structures of ionospheric disturbances by using amplitude scintillations of the L-band (1.5 GHz) positioning signal transmitted from geostationary satellite and observed at Sugadaira Space Radio Observatory, UEC. In this analysis we have also obtained the horizontal movement speed of the ionospheric disturbance with three spaced antennas. The results of analysis structure and movement of ionospheric disturbances are described in connection with the HF Doppler observation.

In this paper, the shapes of amplitude scintillations are mainly categorized into two types described by Karasawa et al.[1]. One is isolated-disturbance type and the other is a consecutive-disturbances type.

Karasawa et al.[1] and Maruyama[2] did not show clearly the relationship between amplitude scintillations in Es and in F. Then we analyzed cause of the ionospheric disturbances by comparing between foEs, HFD and amplitude scintillations. The isolated disturbances were observed when foEs were over 15MHz. On the other hand, the consecutive disturbances were only observed nighttime even when foEs were lower than 10MHz. As a result, it was confirmed that isolated disturbances are closely related to strong Es. At the same time, we compared the occurrence and movement of the HFD with amplitude scintillations on the same Es events. Many of isolated ionospheric disturbances observed by HFD. However the consecutive disturbances did not show correspondence with HFD. It can be interpreted that ionospheric disturbances scintillations shows good agreement occurrence and movement with HFD. Nighttime are randomly spread in F so that HFD cannot detect clear structure.

Local-time-dependence of scintillation in the summer of 2008 are compared Karasawa et al[1] and Maruyama[2] Isolated disturbances occurred in early morning, daytime and nighttime, but consecutive disturbances only appeared in early morning and nighttime. Though observation Karasawa et al.(used 1.5GHz) and Maruyama(used 136MHz), the consecutive disturbances did not occur in daytime. It is explained that our observation were made with high elevation angle which can discriminate the consecutive scintillation into isolated one.