

Examination of the Es propagation model of ITU-R based on VOR long distance propagation and the observation of ionosonde

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The University of Electro-Communications observe Very High Frequency Electric wave Reflected in Sporadic E layer in Chofu and Kure. It is necessary to check electron density structure in a wide area to examine it whether a long-distance propagation wave by a strong Es reflection pro-VHF propagation (GBAS-VDB) is not beyond interference permissible level. In the Es propagation model of ITU-R based on the observation until

the 1970s, expression of relations of the Es reflection ionosphere reflection decrement quantity is guaranteed only to Electric wave Reflected in Sporadic E layer to 80MHz. In this lecture, I express the result about whether it is possible to apply data of the ionosphere reflection decrement quantity observed from VOR observation of frequency around 110MHz and NICT verticality critical point frequency foEs data of the middle reflection point neighborhood to Es propagation model type of ITU-R.

In from May 1, 2014 to September 30, I observed an electric wave of the VOR transmission station of Yoron Island (27.044N, 128.398E) and Yonagunijima (24.457N, 122.998E) which the distance with Yamagawa (31.20N, 130.62E) and the VOR middle reflection point was close in Kure (34.246N, 132.528E). I demanded Yamagawa perpendicular critical frequency foEs and ionosphere reflection decrement quantity for the use frequency and, from data of provided VOR reception electricity, performed the comparison with the Es propagation model type of ITU-R. As a result, which is obtained from Kure VOR reception electricity is smaller than the Es propagation model of ITU-R and gives weaker value than real reception electricity. This goes down assuming the Es reflection model that is bigger than Fresnel zone in the Es propagation model of ITU-R, and it is thought that this is because it observes the Es in Fresnel zone domains by the VOR long distance propagation observation. The ionosphere reflection decrement quantity between Kure and Yoron Island interval of surface of the earth propagation distance 893km has a bigger bigger difference with the predicted value than Kure and Yonagunijima Island interval of surface of the earth propagation distance 1427km. In addition, it becomes the slow degree of leaning in the VOR when I pay attention to a degree of leaning of ionosphere reflection decrement quantity for foEs and shows that an index to express the frequency dependence of the Es propagation model of ITU-R is too big. As a result, it is necessary for the propagation model type of ITU-R in frequency around 110MHz to perform a review. I increase the number of the examination lines and am going to examine an Es propagation model type of ITU-R at around 110MHz in detail in future.

References

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