

## Recent Topics of Standardization on Radiowave Propagation Field

When putting the wireless communication systems into practical phase, interference analysis are important steps that greatly affect the basic performance of the wireless communication system. When evaluating of new frequency allocation, it is difficult to make a legitimate judgment if each group is carried out an evaluation under different propagation conditions. Therefore, standardized propagation model is required. A representative standardization organization for radio wave propagation is ITU-R SG3.

Generally, standardization of new propagation model is started at the starting point of study of new wireless system. There are two choices for development of new propagation model. That are extension of existing propagation model and establishing novel propagation model. In the case of extension of existing propagation model, it is important to keep consistency against existing propagation model.

Recently, allocation of frequency bands for novel wireless communication systems is getting higher year by year. Therefore, let us consider in case we try to extend frequency range of COST231 Walfisch-Ikegami model (WI model) as an example.

Applicable frequency range of WI model is defined from 800 MHz to 2 GHz. When we try to extend frequency range of WI model from 800 MHz to 100 GHz, it can be seen that the propagation loss rapidly increases as the frequency increases in the original WI model in the range beyond the applicable frequency of the WI model. The reason why this trend is happened is from the term  $k_f$  in  $k_f \cdot \log_{10}(f_{MHz})$  that is frequency characteristics in  $L_{msd}$ . Therefore, in order to solve the problem that was clarified by the conventional equation, the logarithmic approximation of  $k_f$  of the conventional model only to the effective range of the conventional equation is performed. This approximation formula is formulated by the following two formulas.

It is found that propagation loss estimation results equivalent to the conventional equation can be obtained within the application range of the conventional equation, and the divergence of loss due to the increase of the frequency can be eliminated. This is a possible solution for keeping consistency against existing propagation model.

In addition to the above mentioned, standardization activities in radio wave propagation, especially the standardization activities in ITU-R SG3, the necessity, standardization procedures and the latest activities are introduced in this talk.