Propagation Channel Modeling for Wideband Radio Systems

- How to create realistic MIMO propagation environments for OTA measurement –

Effective evaluation of MIMO communication terminal performance in actual radio-wave environments has been carried out in over-the-air (OTA) measurements wherein the terminal under test (the device under test, DUT) is placed in a specifically constructed multipath fading environment. For constructing the OTA measurement systems, a propagation channel model not only for having necessary functions but also with simple structure is essential for practical use. For this purpose, we have developed a promising MIMO propagation model incorporating to fading emulators based on "antenna-branch-controlled scheme". In this presentation, based on our studies, we pursue the following points:

1) What functions are necessary for OTA measurement for MIMO user terminal evaluation?

2) What is a good propagation model for the OTA evaluation system?

3) Radiowave radiating system (i.e. OTA) or Non-radiating system (i.e. two-stage scheme)?

Finally, we introduce our experience on the implementation of the proposed scheme into an FPGA board and provide a couple of application examples of this FPGA-based system that demonstrate its usability.