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The development of FPGA-based wireless channel simulator using LabVIEW

Abstract

The development of channel model for wireless communication system is currently becoming important to fulfill the entire user's requirements and increasing demand where to provide a good communication link between the users at everywhere and anytime. An accurate techniques or operator is needed to model a very flexible channel for wireless communication application. Previous channel model is developed based on the time-frequency operator which is limited to Narrowband signaling. This operator uses Doppler shift to account for mobility in propagation space. This paper proposes a Wideband channel model which is valid for all kind of signaling and conditions. Mathematical channel model is used to represent a generic channel simulator which is implemented as channel simulator. The development and measurement of channel simulator is using LabVIEW. The LabVIEW can be used as basic software and can be turned into hardware part by connecting to other devices for real-time channel simulation. The illustration and snapshot of the channel simulator modeling in term of LabVIEW code program are presented.

Keywords

Channel; LabVIEW; Simulator; Time-frequency; Time-scale