IEEE 802.11ad SC-PHY Simulator
with a Real-World 60GHz Indoor Channel Model

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Abstract – The IEEE 802.11ad SC-PHY Simulator is a simulation tool to provide reproducible evaluation of the IEEE 802.11ad single carrier (SC) baseband signal on the physical (PHY) layer level. It allows a flexible set of the most important system parameters, including code rate of the channel encoder and type of modulation. Furthermore, it is possible to select among three channel models: AWGN, fading channel with user defined settings and 60GHz indoor channel model. There is a unique option to select a 60 GHz indoor channel model which is based on real measurements realized in an indoor office at Department of Radio Electronics (DREL). Bit and Frame Error Ratio (BER and FER), data throughput and 60GHz channel characteristics in the time domain are the most important parameters used for the evaluation of the simulation results. The IEEE 802.11ad SC-PHY Simulator has been developed in the program environment MATLAB (version 2017b) which, including the raw data of the measured 60GHz channel, can be downloaded here. More information about this simulator can be found on the linked webpages.
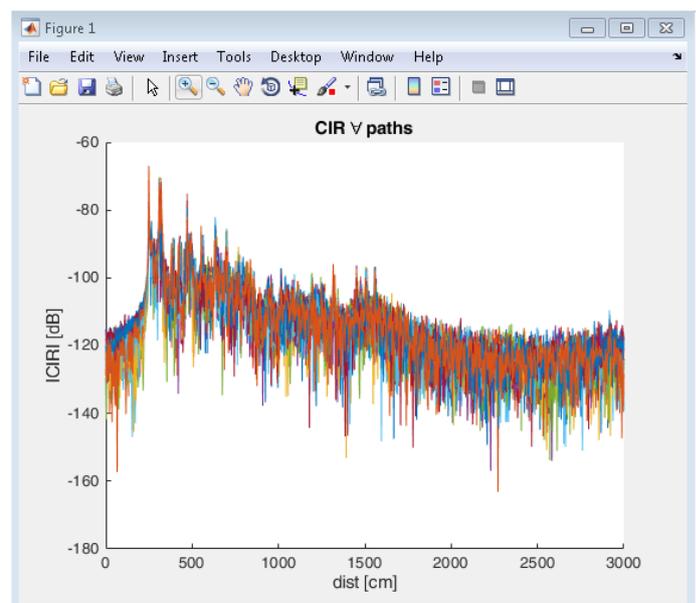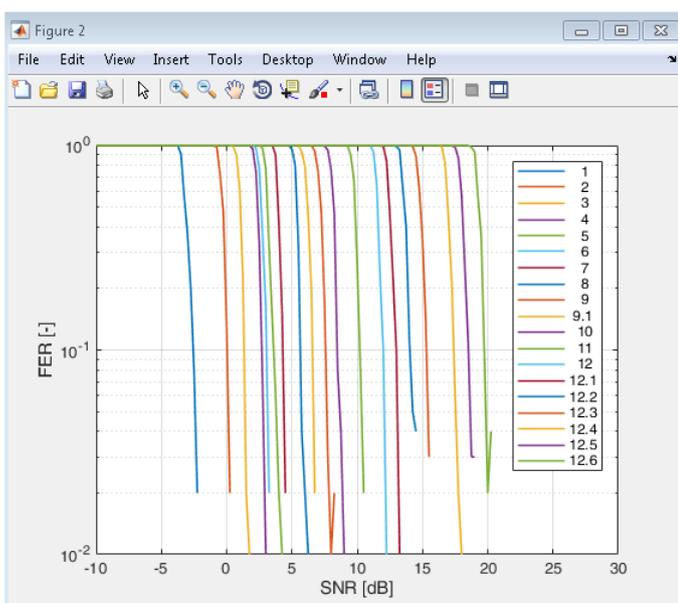

Fig. 1: IEEE 802.11ad SC-PHY Simulator: evaluation of FER in the AWGN channel
and channel impulse response (CIR) of a real 60GHz indoor channel