Digital Hopping of Narrowband Waveform using Wideband Frontend

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Abstract—In many wideband networking waveform applications, there are scenarios where the network requires more range and low data rate. To cover these scenarios, a hybrid networking waveform front-end is proposed in which a narrowband waveform will be running in a wideband networking time slot to connect a user which is present at a long distance. To achieve this, a modification is proposed in the front-end of the physical layer of the wideband networking waveform. The receiver digitally hops between frequencies synchronously with the transmitter as the narrowband signal is sent over seemingly random series of frequencies. The same wideband filters are used to receive both the narrowband and wideband signals.

Keyword—Gaussian Minimum-Shift Keying (GMSK); Direct Digital Frequency Synthesizer (DDFS); Linear Feedback Shift Register (LFSR); Wideband Frontend; Digital Frequency Hopping

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