ANALYSIS OF TIMING OFFSET ESTIMATION SCHEMES FOR UWB SIGNALS (WedPmPO1)

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Abstract :

In this paper a joint symbol, frame and chip synchronization method for an ultra−wideband (UWB) system is presented. We assume that the channel is estimated using pilot waveform assisted modulation (PWAM), and that synchronization is achieved by maximizing the energy of the estimated multipath channel. In order to improve the time and accuracy capabilities, importance sampling was applied for designing a time−hopping system simulator. While keeping complexity low enough for real time implementation, simulation shows the good performance of this method in terms of bit error rate (BER) versus signal to noise ratio (SNR). It is also shown that this synchronization system helps to mitigate the negative effects of timing offset. The performance degradation of the downlink system at a BER=10−2 is only 4 dB compared to the case of perfect timing, and 5 dB in the uplink employing single user detection[1]. [1]This work has been partially supported by CEDINT−UPM

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