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RESEARCH ON PULSE-SYNCHRONIZATION IN BASEBAND OF IMPULSE RADIO-ULTRA WIDEBAND NON-COHERENT SYSTEM

Abstract

Impulse Radio-Ultra Wideband (IR-UWB) is very narrow in time and has wild range of spectrum. As a result, IR-UWB could be used for high-speed data transmission and positioning navigation. The pulse synchronization is an important issue in pulse receiving technology. Our paper mainly focuses on the research on the non-coherent pulse-synchronization in IR-UWB system. Traditionally, phase-locked loop (PLL) is widely applied to the carrier-synchronization in the receiver for the continuous waves. In this paper, we come up with a novel method based on PLL structure to achieve pulse synchronizing, using the monotonicity of pulse signal energy. The method uses integration dump (ID) to calculate the signal energy within a single cycle of the received signal. The integral results reflect the phase information of the pulse within the pulse period. The result of appropriate transform of ID output is then given back to voltage controlling oscillator so as to change its phase of the output. In general, the model is simple in structure and easy for implementation.