On-the-Fly Compensation of Sampling Frequency and Phase Offset in Receiver Performing Ultra-High-Speed Wireless Communication

Abstract

The present invention restores data of a series of symbols transmitted into a receiver, without making the clock of the receiver match the clock of a transmitter. In this receiver, received data that was over-sampled by two times is made into polyphase, and the data is shifted and a filter coefficient (a series of tap coefficients) of a compensation filter is shifted at the same time, by applying a feedback of an adaptation algorithm. Sampling frequency and phase offset can be compensated on-the-fly, by making a received signal pass through a filter that is a combination of a tapped filter, which has a correlation value obtained from a preamble or a header of the received signal set as the initial value thereof, and a wavefront aligner (a wavefront matching-box). Such a configuration is equivalent to achieving a resampling filter circuit, an equivalent filter circuit, and a decimation filter circuit with just one compensation filter circuit, and is able to make dimensions of a circuit far smaller than those in prior art.

Fig. 4