

Absolute polar duty cycle division multiplexing: an economical and spectral efficient multiplexing technique

ABSTRACT

A new multiplexing technique based on duty cycle division is proposed, under the name: absolute polar duty cycle division multiplexing (APDCDM). The new technique allows for more efficient use of time slots as well as the spectrum, taking the advantage of both the conventional TDM and FDM. The basic properties based on theoretical analysis as well as simulation studies have been done to evaluate the performance of this technique based on the signal energy and symbol error rate (SER). In this paper the performance of absolute polar duty cycle division multiplexing is compared with multilevel M-ary as well as with the time division multiplexing (TDM) techniques. The simulation has been set for wireless transmission based on free space propagation model with adaptive white Gaussian noise (AWGN). PSK and QAM are used as modulation schemes to evaluate these techniques against data rates and number of users. The study shows that by increasing the number of users, the energy per bit in APDCDM has better performance than that of TDM technique. The simulation result correspond with the theoretical study shows that absolute polar duty cycle division multiplexing (APDCDM), has better SER than TDM.