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AN IMPROVED SCHEME OF MULTIPATH MITIGATION BASED ON BOC

Abstract

With the development of Global Navigation Satellite System, spectrum is becoming more and more lacking. In order to make full use of the spectrum bandwidth, decrease the mutual interfere between different Satellite System signals and improve the position and navigation accuracy of Satellite systems, a novel unambiguous tracking scheme based on BOC signal is proposed in this paper. This scheme, based on the analysis and comparison of the signal spectrum and autocorrelation function of BPSK and BOC, exploits the correlations between BOC signals and its basis signals in order to eliminate the side peaks. The scheme also determines the slope at both sides of the correlation function's peak as regard to multipath mitigation. This paper shows side-peaks of the autocorrelation function have been clearly eliminated, which incurs no false lock point and a sharper peak narrower than 0.4 chip, based on a series of simulations of the correlation function performance and the multipath error envelope at different bandwidths of RF front end. It also introduces almost no tracking error when the multipath delay is longer than 0.5 chip, and has a tracking error less than 0.05 chip when the multipath delay is shorter than 0.5 chip. Besides, the proposed scheme is applicable for various types of BOC signals such as BOC(kn,n).