

Abstract

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Acquisition of Weak GNSS Signals Using Fast Orthogonal Search

The extreme weakness of a global navigation satellite system (GNSS) signal makes it vulnerable to a wide variety of interfering signals, falling within the GNSS frequency bands. Most of acquisition techniques used now days are depends on Fast Fourier Transform (FFT). The FFT is numerically ill-posed method especially when noise corrupts the signal extensively. Fast Orthogonal Search (FOS) algorithm has been developed to acquire very weak Global Positioning System (GPS) coarse/acquisition (C/A) signals in a software receiver instead of FFT. Simulations indicate that the proposed method can acquire signal below signal-to-noise ratios (SNRs) below 25 dB. The percentage of improvement due to use FOS instead of FFT is 18 % at low SNR.