Analisa metoda estimasi frekuensi dan initial phase offset dengan transformasi fourier pada sistem block demodulator direct sequence spread spectrum

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Abstrak

ABSTRAK
Sistem komunikasi spread spectrum secara umum terdiri dari transmitter, transmission line dan receiver. Dalam transmitter direct sequence spread spectrum sinyal dibangkitkan dengan perkalian sinyal data dengan PN code sequence yang unik yang ditetapkan untuk masing-masing user dan bandwidthnya lebih besar dari data bandwidth. Pada sisi receiver received sinyal direct sequence spread spectrum akan korelasi dengan PN code sequence lokal yang serupa dan spreading PN code sequence dalam received sinyal akan hilang.

Persoalan utama dalam sistem block demodulator direct sequence spread spectrum adalah sulit untuk mendeteksi titik dan arah jumping. Kesalahan pendeteksian jumping kebanyakan disebabkan oleh noise dan interferensi. Dalam tesis ini dianalisa performansi dari jumping detektor dalam mengestimasi frekuensi dan initial phase offset pada sistem block demodulator direct sequence spread spectrum dengan menggunakan transformasi Fourier. Transformasi Fourier berfungsi untuk mendeteksi arah dan titik jumping sehingga keluaran sirkuit arctan (urutan phasa) pada titik tertentu diperbaiki dengan ditambah/dikurangi sesuai arah jumping agar mendekati linier.

Dari hasil simulasi menunjukkan bahwa metoda estimasi frekuensi dan initial phase offset dengan transformasi Fourier pada sistem block demodulator direct sequence spread spectrum dalam mengestimasi frekuensi offset dan initial phase offset relatif memiliki kesalahan estimasi yang semakin kecil sejalan dengan pertambahan Eb/No. Khususnya untuk Eb/No lebih besar dari 10 dB dapat mengestimasi frekuensi offset dan initial phase offset sangat akurat sehingga dihasilkan BER 10'3.
<hr><i>ABSTRACT
Spread Spectrum system is composed of a transmitter, transmission line and a receiver in general. In an spread spectrum direct sequence transmitter, which is currently in use most, the spread spectrum direct sequence signal is generated by multiplying data signal with unique PN-code sequence like white noise assigned to each user in advance, and the bandwidth is much greater than the data bandwidth. On the other hand, the received spread spectrum direct sequence signal is correlated with the identical local PN-code sequence and the spreading PN-code sequence in the received spread spectrum signal is removed,

The critical issue in the block demodulator direct sequence spread spectrum is difficult to detect the jumping point and jumping direction. The jumping detection error is mainly caused by the noise and interference. My thesis analyze performance of jumping-detector using Fourier transform to estimate frequency and initial phase offset in block demodulator direct sequence spread spectrum. The function of Fourier transform is to detect jumping point and jumping direction which can improved the output of arctan circuit to be linear by increase or decrease phase according to jumping point and jumping direction.

From the simulation result shows the characteristic of estimation frequency and initial phase offset using Fourier transform is the estimation error decrease when EbINo increase. Special for Eb/No more than 10 dB the jumping detector can estimate frequency and initial phase offset almost correctlylaccurate with BER 10'3.</i>