

Master 2019

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Galileo E1/OS Signal Acquisition and Tracking.

ABSTRACT - Masterthesis

The objective of this work is to collect the real satellite data, and then implement the algorithms of acquisition and tracking to demodulate the navigation bits.

This project starts with the study and understanding of Galileo signal structure and the modulation scheme as Galileo uses a new type of modulation. After that, the real satellite data is collected using antenna. Once the data is collected then the algorithm of parallel code phase search acquisition is implemented.

This technique of acquisition is also called FFT based acquisition. The outputs of acquisition are code phase and doppler frequency which are served as inputs to the tracking module.

Next, tracking module which is an iterative process is implemented to extract the navigation bits. The estimates of code phase and doppler frequency acquired from acquisition are used to initialize the carrier tracking loop and code tracking loop. After that, the secondary code sequence is achieved, in case when E1-C which is a data less channel is tracked. When E1-B channel also called data channel is tracked, the result would be navigation bits.

Finally, the results of implemented algorithms are evaluated and the decoding of the navigation bits is briefly discussed to conclude this project.