ROBUST GNSS SIGNAL DEMODULATION

Innovative method and device for spread spectrum radio navigation signal demodulation that does not require a connected carrier loop

Potential applications

GNSS receiver
Ground and on-board, all vehicles
Applicable for the demodulation of modern satellite navigation signals: GPS-IIF L5 and L2C, GALILEO, GLONASS, COMPASS, QZS

Invention overview

Method and device for spread spectrum radio navigation signal demodulation comprising a data channel modulated by a navigation message and an unmodulated pilot channel.

After combining these channels and performing despreading, the demodulation of the despread data signal enables obtainment of the navigation message (with a bit error rate of up to 10%).
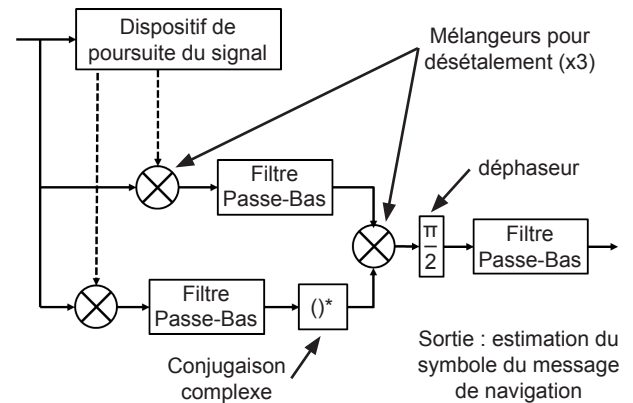

Schéma bloc du principe général

Technological benefits

More robust demodulation
Demodulating the navigation message is no longer dependent on the search threshold of a phase-locked loop (PLL)

Demodulation can be performed in code-only mode

A simplified receiver architecture
Because carrier phase recovery is no longer necessary, there is no need to use a phase-locked loop
The receiver can simply use an FLL loop to search for the carrier
Simplified receiver architecture and greater robustness than with a PLL.
It is possible to estimate the symbol of the message received for data wiping purposes, even when the signal-to-noise spectral density ratios are lower than the PLL dropout threshold

Commercial benefits

Optimal performance
Modernized reception of GPS and GALILEO signals under difficult conditions

Does not necessarily require changes to the ASIC: depending on receiver architecture, a software modification may suffice

TRL : ?

Patented invention, available under license

For further information

CNES Valorisation :
+33 (0) 5 61 27 35 53
valorisation@cnes.fr

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