

International Symposium on GPS/GNSS 2008

» Abstract

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Serial NO.	412
Create DateTime	2008-06-15 23:09:05
Update DateTime	2008-09-28 13:16:55

Preferred Type of Presentation	oral/review
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Category	Receiver Design and Signal Processing
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Title of the Paper	A Self-adaptive Code Tracking Loop Design for Galileo BOC(1,1) Signal
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Abstract	<p>The innovative BOC (1, 1) modulation was introduced by Galileo system. The use of BOC (1, 1) signal can reduce the code tracking error variance through using the conventional early minus late discriminator. However, it has also created a potential problem that there are two stable false lock points during tracking due to the side peaks of the BOC(1,1) autocorrelation function. The stable false lock points could result in ambiguous (or biased) measurements if no special care is taken.</p> <p>This article presents a new technique for sine-BOC(1,1) ranging signals, which is called self-adaptive code tracking loop. A code tracking loop status indicator (CTLSI) is used to switch the two discriminators and to detect whether the false lock occurs or not. One of the two discriminators, known as the “main discriminator”, is a conventional early minus late discriminator. It is available while tracking in the correct autocorrelation function peak. The other one is the “rectifying discriminator” used for rectifying the code error to the linear region of the “main discriminator” when the false lock occurs.</p> <p>The proposed code tracking loop has been implemented in a software Galileo receiver and tested. Experiment results show that it could detect and rectify false locks efficiently while remaining the advantages of BOC signal tracking.</p>
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