Abstract

The position solutions provided by the Global Navigation Satellite Systems (GNSS) for the possible Geodetic-grade applications can sometimes be severely corrupted by multipath. Thus it becomes necessary to estimate and/or mitigate the possible causes of the multipath. However less attention has been given to the detection of multipath. The multipath detection method proposed in this paper, targeted at multiple antenna GNSS receivers, is based on the relation between the arithmetic and the geometric means of the covariance matrix eigenvalues. This relation is used to build a metric, whose theoretical distribution is known in the absence of multipath. Comparison between the empirical and theoretical distributions is done by the Kolmogorov-Smirnov test, which is the basis of the proposed algorithm. It operates directly on
the digitized signal, in parallel to tracking loops, and has no need of inferring the number of multipath components or computing their delays. The resulting detector is CFAR (i.e., Constant False Alarm Rate), meaning that it allows to set detection thresholds independently of the incoming noise power by adjusting the false alarm probability.

References


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Index Terms

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Keywords

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