

An analysis of potential performance of passive TDOA systems with a short baseline

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Improving the effectiveness of passive systems, as shown in [1] is associated with a decreasing of base distance between the receiver sites and therefore simultaneous increasing of accuracy of measurement of the differential time of the signal coming in these sites. One of the important parameters of passive TDOA systems with a short baseline, by which is made an assessment of their effectiveness is the coverage of system. The coverage of passive systems outlines the space inside of which the error estimates of the radio-frequency source location with given probability does not exceed the selected value [2]. Based on the conditions of the use of radio-frequency sources on the land, sea and air locations the maximal coverage of the passive TDOA system is within the limits of "line of sight". The report analyzes the various factors and their impact on the coverage of passive TDOA systems with a short baseline. These factors include conditions of radio-waves propagation, system power quality factor (Q-factor), the geometry of the location of receiver sites and the coherence degree [3 - 5]. The report outlines the principles of the influence of external factors on the deformation of zone boundaries of the system coverage. Based on the analysis of measuring the value of errors of the differential time of signal arrival on the receiver sites, which are caused by the influence of various factors, the report provides the analysis of potential performance of the passive TDOA systems, and also the results of theoretical studies of the deformation of systems coverage which are predefined by the influence of signal specular reflection from the surface of two medium (Fig. 1).

In the report are given recommendations for improvement of work of adaptive spatial filter, what is made at the expense of signal processing in additional spatial channels.

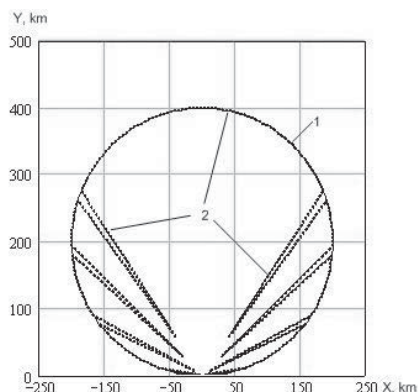


Fig. 1.

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