

Performance Degradation for the GLR Test-Statistics for Spatial Signal Detection

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Abstract : Antenna arrays are widely used in modern radio systems in sonar and communications. The solving of the detection problems of a useful signal on the background of noise is based on the GLRT method. There is a large number of problem which depends on the known a priori information. In this work, in contrast to the majority of already solved problems, it is used only difference spatial properties of the signal and noise for detection. We are analyzing the influence of the degree of non-coherence of signal and noise unhomogeneity on the performance characteristics of different GLRT statistics. The description of the signal and noise is carried out by means of the spatial covariance matrices C in the cases of different number of known information. The partially coherent signal is simulated as a plane wave with a random angle of incidence of the wave concerning a normal. Background noise is simulated as random process with uniform distribution function in each element. The results of investigation of degradation of performance characteristics for different cases are represented in this work.

Keywords : GLRT, Neumann-Pearson's criterion, Test-statistics, degradation, spatial processing, multielement antenna array

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