CONTENTS AND ABSTRACTS

RADIO ENGINEERING AND COMMUNICATION SYSTEMS

Keywords: Internet of Things, MIMO, wireless sensor networks, differential space-time block coding, capacity, scatterers, Alamouti coding, COST-259, Rice factor.

This paper studies the characteristics and performance of a communication system using differential space-time block coding in Rice channel. Channel capacity is analyzed in the presence of scatterers located in the region where transmitting and receiving devices are installed. A three-dimensional COST-259 compliant model of scatterer locations is used to estimate the changes in signal amplitude and phase during propagation. The aim of the study is to study system performance using differential block coding, which requires no estimation of channel matrix at a receiving end for different power ratios of direct beam and diffusion component. This work analyzes ergodic capacity and bit error probability as a function of signal-to-noise ratio when using differential coding. The results show the negative effect of scatterers on link efficiency and the advantages of differential coding with Alamouti coding.

Keywords: probability distribution density, least squares method, polynomial coefficients.

The issues of calculating probability distribution density of polynomial coefficients which are obtained using the least squares method, are considered. The aim of the work is to derive the distribution laws of polynomial coefficients estimates calculated using the least squares method. The analytical form of probability distribution densities of these coefficients is necessary to calculate a detection threshold when detecting signals against the background of non-stationary noise. The paper provides analytical expressions for corresponding probability distribution densities. In order to determine the reliability of the results obtained, simulation modeling was carried out, within which the corresponding histograms were obtained being used in Chi-square goodness-of-fit test. Test statistics corresponding to the significance level of 0.05 is 5.42 and 6.92, respectively.

Keywords: electrostatic location, electrostatic monitoring, electrostatic fluxmeter, electrostatic probe, aerial reconnaissance vehicles.

The accuracy of location and response time to the aircraft of information and measurement system of electrostatic location, which is based on passive measurements of electrostatic field strength at the points of protected area, are considered. The aim of the work is to determine the distance that the aircraft overcomes after crossing the guarded perimeter before it is detected, as well as the influence of sensor location on the accuracy of response. The results were obtained taking into account the use of a convolutional algorithm for digital processing of full length of electrostatic signals arising from the movement of a charged flying apparatus near a sensor. The error in calculating target coordinates is analyzed, taking into account the error in calculating electrostatic signal features. The answer to the question of sensor placement step is given not

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