

Multibeam distribution of waves in the channel of radio contact of the systems transmissions given: design and methods of improvement of indexes of the system

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Abstract - that the environment of distribution brings in distortion in an ideal signal, radiated a transmitter, both as a result of addition of noises and by distortion of useful signal. Noises of radio channel include base-line noise of ether, parasite radiations of industrial electrical equipment and other extraneous radiations.

Keywords – MIMO, OFDMA.

By the feature of the off-wire systems transmissions given, comparatively with lead, there is a presence of account of features of surrounding space, as environments of distribution of radio waves. It is known [1-3] that the environment of distribution brings in distortion in an ideal signal, radiated a transmitter, both as a result of addition of noises and by distortion of useful signal. Noises of radio channel include base-line noise of ether, parasite radiations of industrial electrical equipment and other extraneous radiations. Distortion of basic signal, mainly, predefined the effect of multibeam distribution of radio waves, which consists in the frequent reflection of radio waves from natural and artificial obstacles. As a result on a receiving side get the far of copies of the same signal. Additional distortions of useful signal arise up also as a result of moving of receiver, transmitter and hindrances between them.

Distance of connection is determined losses in the environment of distribution, their influence can be compensated thus, as by power of transmitter so by the sensitiveness of receiver. More difficult is an account of influence on authenticity of the accepted information of fluctuations of size and forms of the accepted signal, predefined interference. For example, at rapid feeding there is distortion of spectrum of informative signal in a LF area which is in the area of Doppler-expansion of spectrum. Only diminishing of rate of movement of objects, or application of

the special methods accepted signal processing which allow to compensate frequency change, it is possible to decrease the amount of errors. Consequently, it is possible to consider that rapid feeding largely influences on authenticity of the accepted information and, does not influence on distance of connection. For districts with thick city building practically line-of-sight absents between a transmitter and receiver, thus probability of distributing of amplitude of the accepted signal is described the law of Riley, and in the case of presence of such visibility – by the law of Rays [2-4].

A design is in-process conducted, from the use of the system of Matlab [1] of channel of radio contact taking into account the presence of Doppler-change of frequencies of influence of hindrances which result in the presence of the accepted signal, in obedience to distributing of Riley or Rays.

The ways of removal of harmful influence of multibeam distribution of waves are also considered. The special place occupies research of adaptive aerials, and aerials with many entrances and outputs (MIMO of aerials), taking into account the features of arrays. The modern methods of fight are considered also against multibeam distribution of waves is the use of modulation with many subbearings (OFDM, OFDMA and SC-FDMA of modulation). For research of the indicated ways also in the system of Matlab the graphic are developed in man-machine interfaces which provide evidentness and comfort of process of researches.

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