

0.The development of the methods for improving efficiency of the space-time processing of the telecommunication signals with interferences

1. **State registration:** 0109U002225
2. **Head** prof. Yakornov Yevhenii A
3. **Results**

Sense of work consists of analysis of modern world trends in progress of the space-time processing theory, development of new methods of radio signals processing with space-time structures, which are factorized with the use of Croneckers` matrices muptlication theory for the radio electronic facilities' digital adaptive arrays, and also analysis of possibility of the physical phenomenon of curvature of wave front of electromagnetic wave application for the increase of efficiency of functioning of the telecommunication systems in the conditions of interferences.

The mathematical model is offered for description of responses of additive mixture of useful signal, interferences and internal noise, which are digitized both in space and in time, in the channels of digital adaptive array, being based on theories of the face-splitting and Croneckers' works of matrices multiplications, with the use of which the statistical synthesis of algorithms of space-time processing of signals is produced for the combined antenna systems with the different width of antenna pattern with the use of the known criteria of optimality at the arbitrary form of wave front of radiation source for the decision of problems of interference immunity and electromagnetic compatibility of radio electronic. Application of the indicated mathematical model unlike the known mathematical models of signals allows to get the optimal values for vectors of the weight coefficients of the stages of spatial and temporal processing in digital adaptive array independent of each other, which comfortably for the theoretical analysis of efficiency of processing on each of the stages.

On the basis of the synthesized algorithms of space-time processing of signals and new methodology of estimation of electromagnetic compatibility of radio electronic facilities the simulation design of antenna system which using radiation pattern adapted to influence of interferences on the parameters of electromagnetic compatibility of mobile communication of standard of GSM networks with the use of the specialized analysis and planning of radio networks of ICS Telecom software is done.

Back