

## 0. Raise of broadband radio access systems capacity by use of MIMO

1. **State registration:** 0108U000520
2. **Head** Sergii Kravchuk
3. **Results.**

Work is devoted creation of theoretical baseline for working out and research of principles and methods of raise of capacity (PC) for microwave broadband radio access systems (СШР) by use of production engineering of adaptive existential machining of signals MIMO (Multiple Input Multiple Output).

The method of a channel estimation for OFDM-systems with MISO and with space-time-and-frequency coding which allows to reduce essentially factor of bit errors of the channel with a fading is given. The method of linear space transformation with optimization of transferred power as the effective approach to raise PC is offered. Application CMIMOR as the new architectural solution for construction СШР of following generation with high PC is observed. Formulas for definition PC of a network are gained at consecutive and parallel retransmissions. The analytical model of probability of an error in multiantenna co-operative relaying system is developed. Use of the fixed repeaters in a network with a known infrastructure for maintenance of a scoring of a space diversity of medium of wireless terminals which have restriction on quantity of antennas is investigated. Mathematical models эргодической PC and probabilities of a bit error microcellular MIMO-системы with existential block coding and phase-shift keying for the channel with a fading are gained. The comparative analysis of characteristics PC and BER, counted for known analytical models MIMO-канала and gained experimentally is carried out. Approaches to raise PC of radio system with MIMO at the expense of decrease of agency of intercellular handicapes are offered.

Imitating models of physical level MIMO-системы for software packages Visual System Simulator (VSS), integrated with package MWO (Microwave Office) are offered company AWR, and SIMULINK package MATLAB. The original program blocks integrated by medium VSS are developed, namely: built in DLL libraries (C/C++) and additional modules MATLAB which can be used in practice at modelling of radio section MIMO-системы. The model of physical level of system WiMAX for SIMULINK package MATLAB is created. In addition to known model of radio channel WiMAX which is a part of standard library MATLAB of version R2008a, the offered model switches on the module of adaptive modulation and coding, and also original module MIMO with existential coding.

Back