

# WiMAX Systems Capability Enhancement

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**Abstract** - In this paper ways of increasing transmission speed, inter-symbol interference reason and combat techniques which caused by signal reverberation in mobile communication systems are given.

**Keywords** - MIMO, adaptive filters, OFDM, 64QAM, polarization.

## I. INTRODUCTION

Nowadays, high speed transmission in WiMAX systems employed multi-position relative quadrature modulation and high signal to noise ratio. Also, parallel transmissions are used, like OFDM, MIMO etc.

The article studying possibilities of increasing transmission speed of the speed transmission increasing by polarization of the electro magnetic waves.

## II. MAIN

From the article [1] we know that polarization by 22.5 degree gives 15 dB channel isolation. Therefore it is possible to design system with 5 independent channels differentiated by signals with 22.5 degree polarization. It gives five-fold transmission speed increase from previously reached by other methods. The triple-folded increase was studying in another author's work [2].

In present time, WiMAX systems as new generation high speed wireless communication systems widely used for building prospective broadband access facilities due to higher information capacity, bigger coverage area which supplied by these kinds of systems and characterized by extended quality control system (QoS). In these systems all modern technologies can be applied: OFDM modulation, adaptive modulation and coding [3], adaptive solution for specific task – antenna system deployment, spatial-time coding, and MIMO. All these approaches combat with fading which occurs in multi-beaming propagation and improvement system operating parameters. It is possible to state that proposed WiMAX system is able to provide 75 Mbit/s transmission data rate for 50 km distance per channel in forward and reverse directions [4].

Receiving errors conditioned by inter-symbol and inter-channel distortions are different. Inter-symbol noise is constant in time and depends on some chosen parameters: guard interval, etc. In that time inter-channel distortion consists of not only from constant noise but also has variable part which is conditioned by signal reverberation, Doppler effect, etc. These distortions usually named as fading.

Traditional methods to combat with these different fading are: diversity reception, guard interval increasing, spectrum enhancement, adaptive filters in receiver, using MIMO technology, noise immunity channel coding.

## III. CONCLUSION

This work recommends usage of all encountered methods to combat with fading independently in all 5 trunks differentiated by polarization of the electromagnetic waves which were discussed in the beginning of this paper.

## REFERENCES

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