

ABSTRACT

In this thesis presents the problems of chromatic dispersion compensation in the existing operator telecommunication lines.

These lines were built on the basis of ITU G.652 A and B fibers and are constantly expanded by adding SMF fiber lines based on the latest ITU G.652 D standards. On the other hand, over the years, operators have implemented incoherent DWDM systems, which causes that with the continuous growth of users' demand for wider and wider bandwidth, proper compensation of dispersion in long lines becomes a critical problem

Replacing these cables with the newer NZDSF with flat chromatic dispersion characteristics is not possible due to the huge investment costs.

Due to the need to minimize capital and operational costs, we are looking for cost-effective solutions that can meet the above-mentioned needs with the maximum use of the existing fiber optic networks as well as the implemented DWDM systems.

Thesis presents an analysis of ways to improve the bandwidth based on the existing fiber-optic infrastructure, without replacing all existing cables.

The methods of designing modifications to the existing optical fiber lines that can be used in operator optical line are presented. The most commonly used models are presented, but also other possibilities of achieving chromatic dispersion compensation with even lower investment costs are shown.