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Signal breathing losses in filters based on optical channel with high index modulation

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Abstract

In this paper, the authors demonstrate the existence of a new type of losses later called 'Signal breathing losses'. They have adopted this name because when the optical signal propagates in the propagation channel it changes its size and its position each half period. These dimensions changes will force the signal to get out from the transmission channel with signal losses and part of its proper power making it less confined. They have been able, theoretically and experimentally, to measure small variations in the signal which propagates in the optical propagation channel to 3D or in the plans XY, XZ and YZ. Furthermore, the authors measured and quantified the signal breathing losses based on the depth of corrugation, the size and of the number of periods. Then they affirmed that this type of loss increases with a significant number of periods, with periods of large dimensions, or disturbances to index modulation characterized by important depths. These measures were performed on a set of Bragg filters done on an optical propagation channel of type broadcasted waveguide.

The authors believe the 'Signal breathing' phenomenon is similar to that of 2G and 3G wireless systems including code-division multiple access (CDMA) which is the cell breathing phenomenon due to alteration of the data traffic.

keyword

Signal breathing, Loses, Filter, Index modulation, Optics Communications.

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