

## Optical Switching Based On Bragg Solitons in A Nonuniform Fiber Bragg Grating

**Authors :** Abdulatif Abdusalam, Mohamed Shaban

**Abstract :** In this paper, we consider the nonlinear pulse propagation through a nonuniform birefringent fiber Bragg grating (FBG) whose index modulation depth varies along the propagation direction. Here, the pulse propagation is governed by the nonlinear birefringent coupled mode (NLBCM) equations. To form the Bragg soliton outside the photonic bandgap (PBG), the NLBCM equations are reduced to the well known NLS type equation by multiple scale analysis. As we consider the pulse propagation in a nonuniform FBG, the pulse propagation outside the PBG is governed by inhomogeneous NLS (INLS) rather than NLS. We, then, discuss the formation of soliton in the FBG known as Bragg soliton whose central frequency lies outside but close to the PBG of the grating structure. Further, we discuss Bragg soliton compression due to a delicate balance between the SPM and the varying grating induced dispersion. In addition, Bragg soliton collision, Bragg soliton switching and possible logic gates have also been discussed.

**Keywords :** Bragg grating, non uniform fiber, non linear pulse

**Conference Title :** ICECCE 2014 : International Conference on Electronics, Computer and Communication Engineering

**Conference Location :** Istanbul, Türkiye

**Conference Dates :** December 05-06, 2014