

## Optical dark and bright soliton generation and amplification

### Abstract:

We propose two designed systems consist of series of micro ring resonator (MRR) and an add/drop filter in which the optical dark and bright soliton pulse propagating within the nonlinear waveguides can be amplified which can be used in long communication system. The dark or bright soliton is input into designed systems and travels within the waveguide. A continuous soliton pulse is sliced into smaller pulses by the nonlinear effect which is known as chaos. The power amplification occurs when the soliton propagates along the MRRs or add/drop filter systems. The add/drop filter system can itself be used to amplify the optical soliton when the bright soliton is input at the drop part of the system. In this work we have studied the generation of amplified pulse of optical dark and bright soliton when they propagating inside single systems or when they interact and collide during propagation inside an add/drop filter system. It means that amplified soliton pulse also can be obtained when two types of soliton i.e., dark and bright soliton collide with each other in a same system. In such a way the amplified dark soliton or bright soliton can be used to perform the long distance link.