MRR quantum dense coding for optical wireless communication system using decimal convertor

Abstract:

In this study, simply two systems consist of series of microring resonators (MRRs) and a add/drop filter are used to generate a large bandwidth signal as localized multi wavelength, applicable for quantum dense coding (QDC) and continuous variable encoding generation using incorporated system. This technique uses the Kerr nonlinear type of light in the MRR to generate multi wavelength for desired application especially in internet security and quantum network cryptography. Quantum dense encoding can be perform by output signals of selected wavelengths which are incorporated to a polarization control system in which dark and bright optical soliton pulses with different time slot are generated. Generated dark and bright optical pulses can be converted into digital logic quantum codes using a decimal convertor system in which transmission of secured information are perform via a wireless network communication system. Results show that multi soliton wavelength, ranged from 1.55μm to 1.56μm with FWHM and FSR of 10 pm and 600 pm can be generated respectively.