

## Generation of discrete frequency and wavelength for secured computer networks system using integrated ring resonators

### Abstract

In this study, a system of discrete optical pulse generation via a series of microring resonator (MRR) is presented. Chaotic signals can be generated by an optical soliton or a Gaussian pulse within a MRR system. Large bandwidth signals of optical soliton are generated by input pulse propagating within the MRRs, which can be used to form continuous wavelength or frequency with large tunable channel capacity. Therefore, distinguished discrete wavelength or frequency pulses can be generated by using localized spatial pulses via a networks communication system. Selected discrete pulses are more suitable to generate high-secured quantum codes because of the large free spectral range (FSR). Quantum codes can be generated by using a polarization control unit and a beam splitter, incorporating to the MRRs. In this work, frequency band of 10.7 MHz and 16 MHz and wavelengths of 206.9 nm, 1448 nm, 2169 nm and 2489 nm are localized and obtained which can be used for quantum codes generation applicable for secured networks communication.