

RSoft Application Gallery: Ring Modulator PIC

Tool Used: OptSim Circuit

Resonator based optical modulators have attracted increasing interest lately [1]. These modulators are of special interest for radio-over-fiber application due to their potential offering of high spurious free dynamic range (SFDR).

The layout uses phase modulating component in the ring resonator structure as shown in Fig. 1.

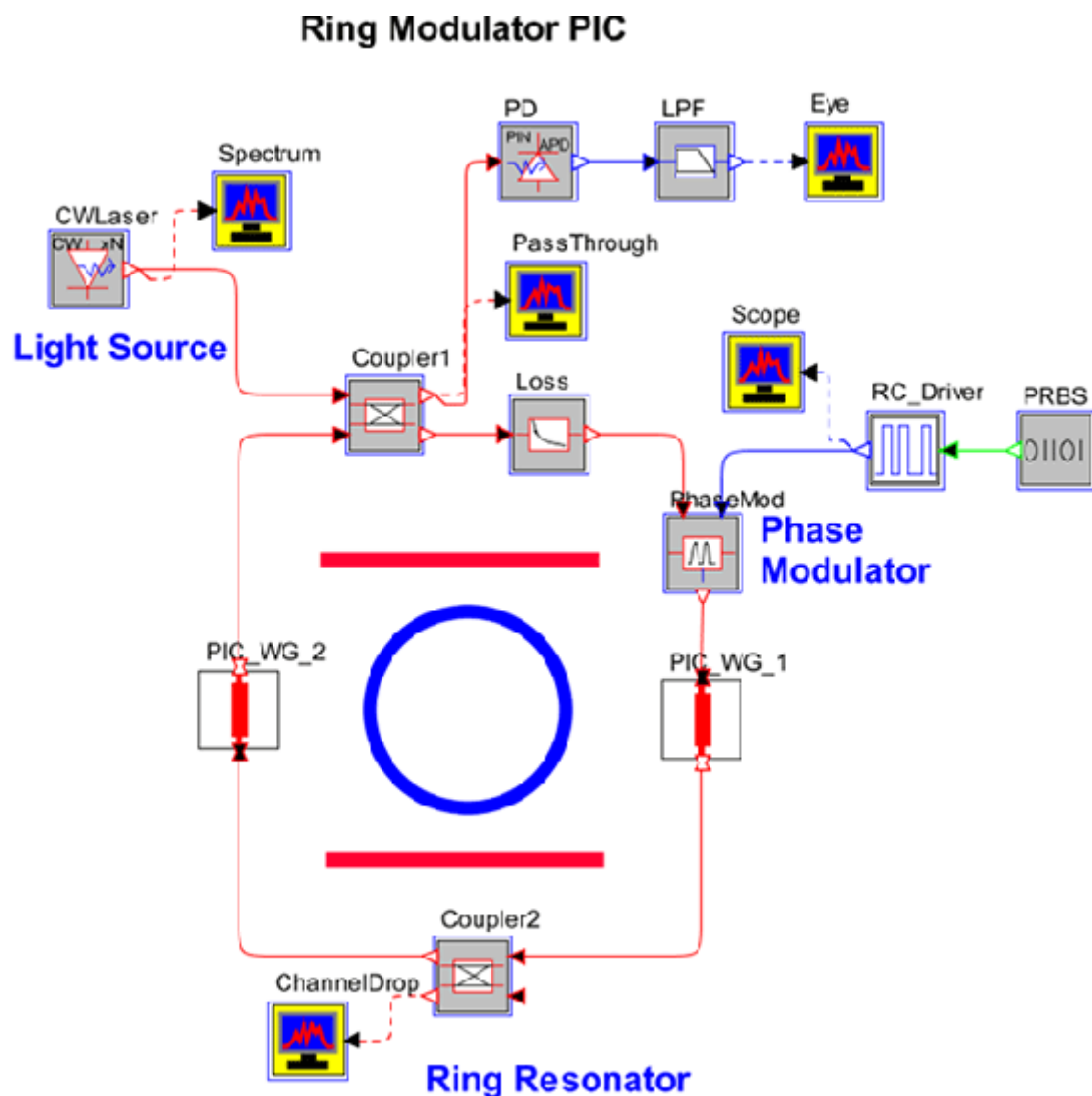


Figure 1: Layout of the ring modulator PIC

The CW light is launched into the ring resonator. The phase modulator is driven by a PRBS data source with NRZ raised cosine drive.

Figure 2 shows modulator driving signal (left) and corresponding eye diagram (right).

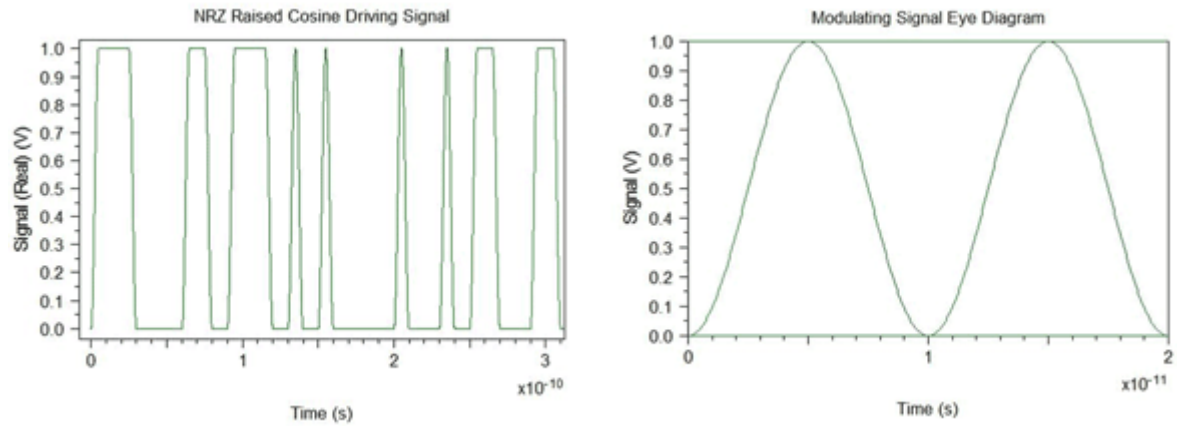


Figure 2: Driving signal for the modulator (left) and corresponding eye diagram (right)

The CW wavelength is modulated by the PRBS data and received via the pass through node where a receiver comprising of a photodiode and post-detection filter is located.

Figure 3 shows modulated optical signal (left) and received eye diagram (right).

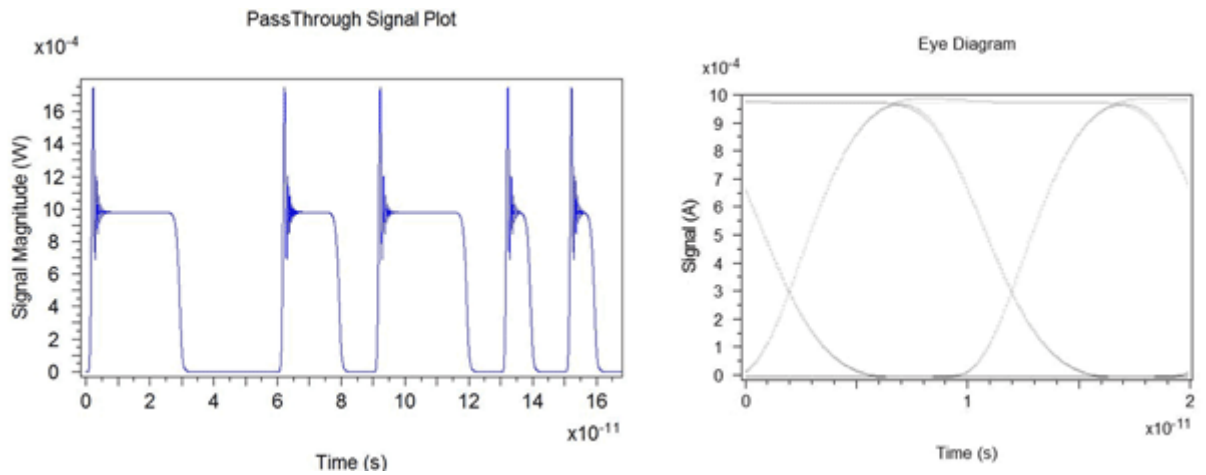


Figure 3: Modulated optical signal (left) and receiver eye diagram (right)

References:

¹ A. Prescod, et al, "Effect of ring resonator waveguide loss on SFDR performance of highly linear optical modulators under suboctave operation," IEEE Photonics Technology Letters, vol. 22, no. 17, pp. 1297-1299, 2010