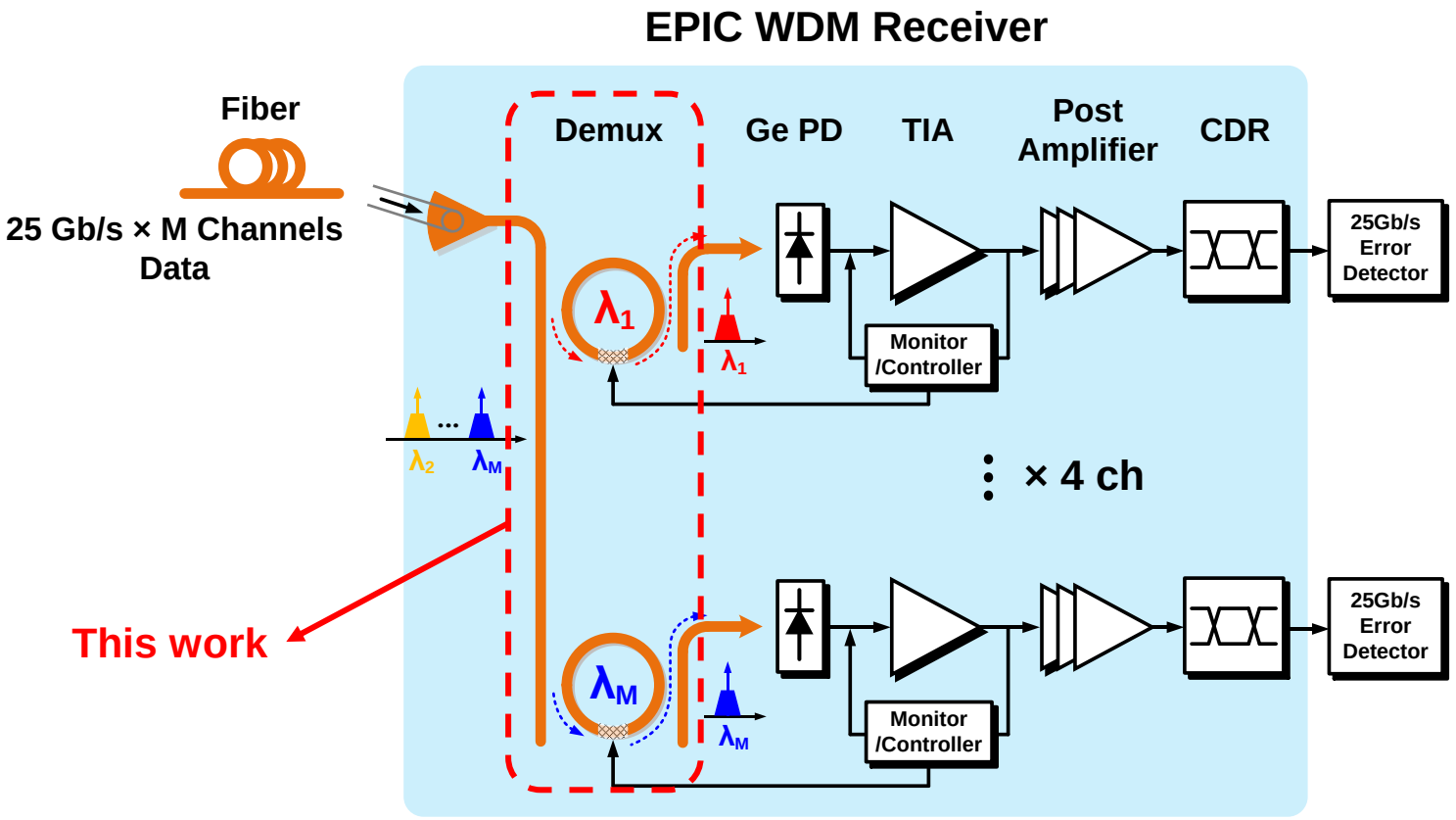
Ring Filter Design for Si-photonic WDM Receiver



- Demux device: Add/drop ring resonator
  ➔Small footprint & controllable by drop port

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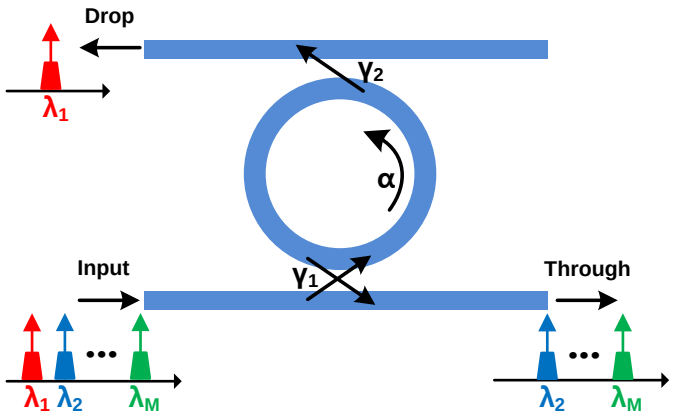
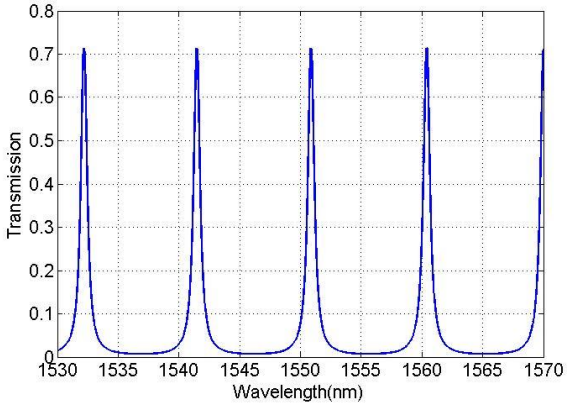


$$\frac{I_{drop}}{I_{input}} = \frac{(1-\gamma_1^2)(1-\gamma_2^2)\alpha}{1-2\gamma_1\gamma_2\alpha cos\phi + (\gamma_1\gamma_2)^2}$$

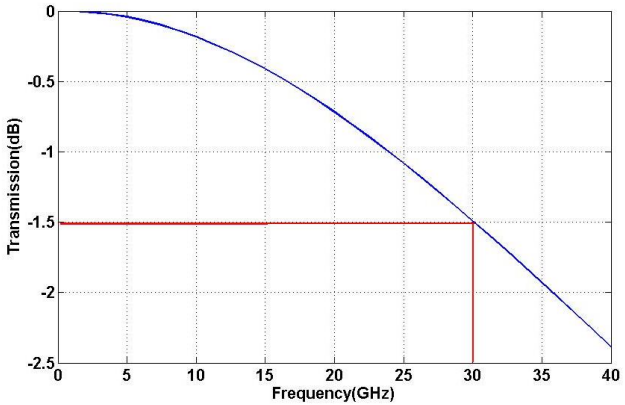
$$\rightarrow T_{max} = \frac{(1-\gamma_1^2)(1-\gamma_2^2)\alpha}{(1-\gamma_1\gamma_2\alpha)^2}$$

Round-trip Steady-state Equation

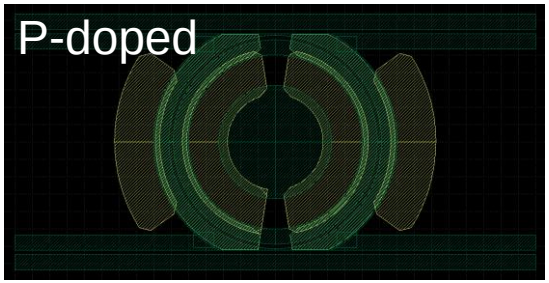
- 30-GHz BW
- -1.5dB Insertion loss
- Thermal tuning by doping in waveguide
- Integration with Ge-PD & Receiver



<Transmission curve>



<Normalized frequency response>



<P-doped ring resonator layout>