100Gb/s DQPSK Transmission at 1300nm

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DQPSK for 10km SMF

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- 100Gb/s DQPSK transmission at 1550nm
  - 2km SMF without DCF
  - 50km SMF with DCF

Transmission performance is mainly limited by accumulated Chromatic Dispersion at 1550nm.

⇒ Performance at 1300nm ?

Tx & Rx Configuration
- Optical Components -

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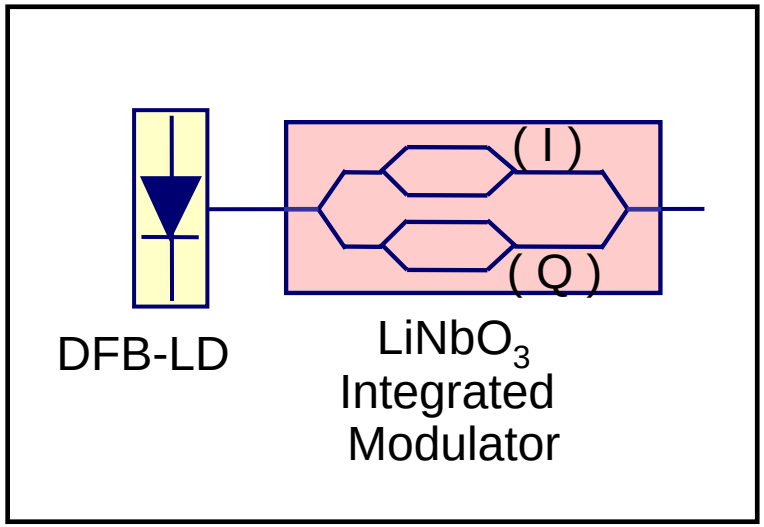
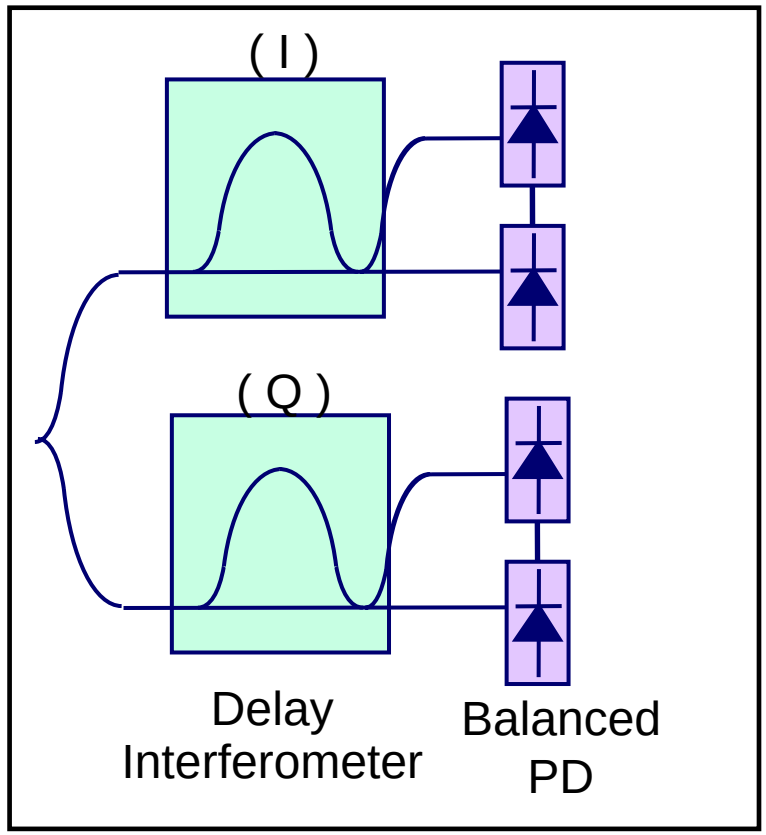
Tx



Rx



Operation capability of four optical components at 1300nm should be considered.

Operation capability of optical components at 1300nm

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DFB-LD	○
$LiNbO_3$ Integrated Modulator	○
Delay Interferometer	○
Balanced PD	○*

* 1.0 - 1.5dB sensitivity degradation from 1550nm operation

CD Tolerance

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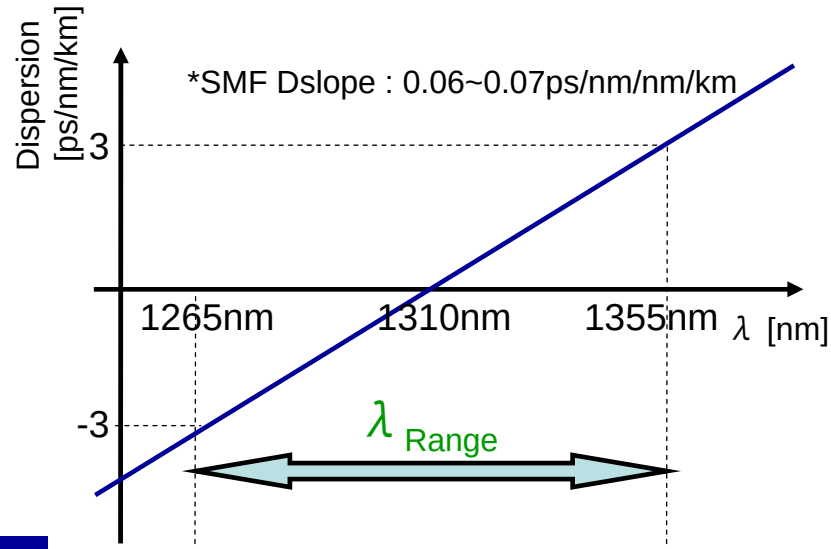
- Chromatic Dispersion (CD)

  CD Tolerance : ±30ps/nm for 100Gbps DQPSK

10km transmission

→ $|CD_{SMF}| < 3$ps/nm/km

→ λ_{Range} : 1265nm - 1355nm



→ **Wide λ availability**

→ **Higher capacity/fiber with WDM in the future**

PMD tolerance

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- Polarization Mode Dispersion (PMD)

PMD Tolerance : DGD=～6ps for 100Gbps DQPSK

Considering 4E-5 outage probability → <DGD>=DGD/3

→ <DGD>=～2ps

10km transmission

→ $PMD_{SMF} < 0.6ps/\sqrt{km}$ (← $2ps/\sqrt{10km}$)

* PMD : Standard SMF ～$0.1ps/\sqrt{km}$

Wide Fiber availability

Conclusions

100Gb/s DQPSK transmission at 1300nm

- Optical components can operate
- Wide λ and large fiber availability

DQPSK format is one of the candidates for 100 Gb/s transmission on 10km SMF