Chromatic dispersion compensation

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Chromatic dispersion compensation

Chromatic Dispersion

Static compensation

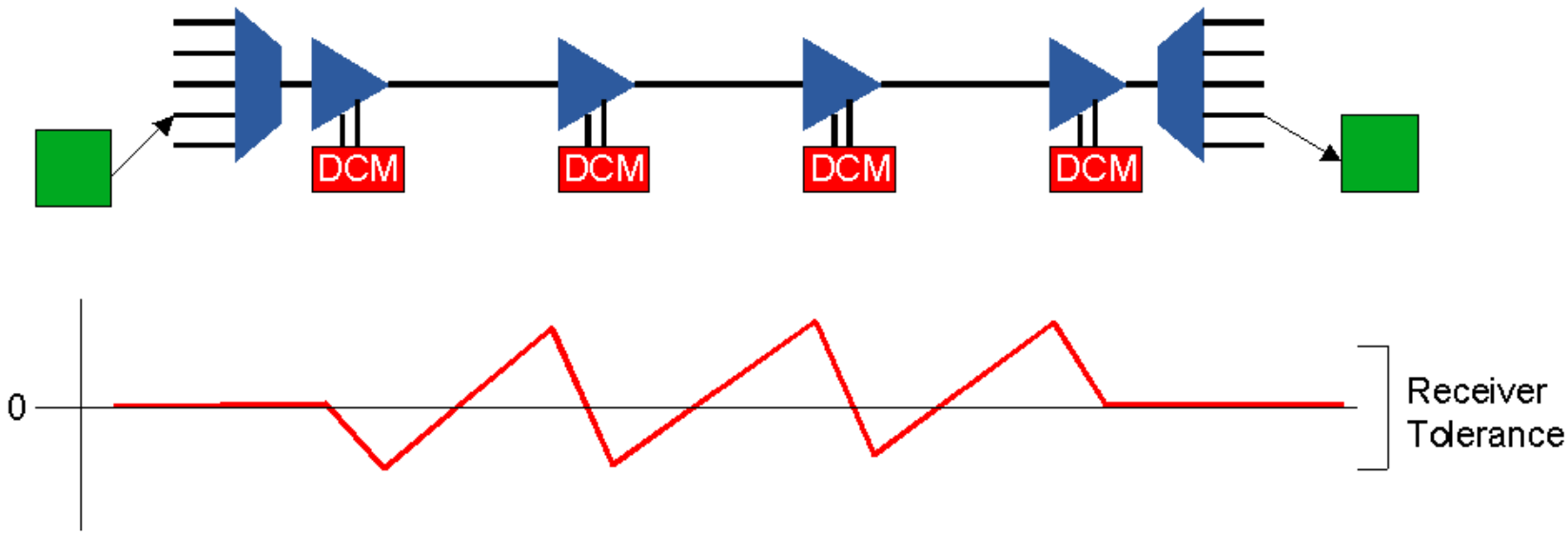
Electronic compensation

Discussion

Chromatic dispersion

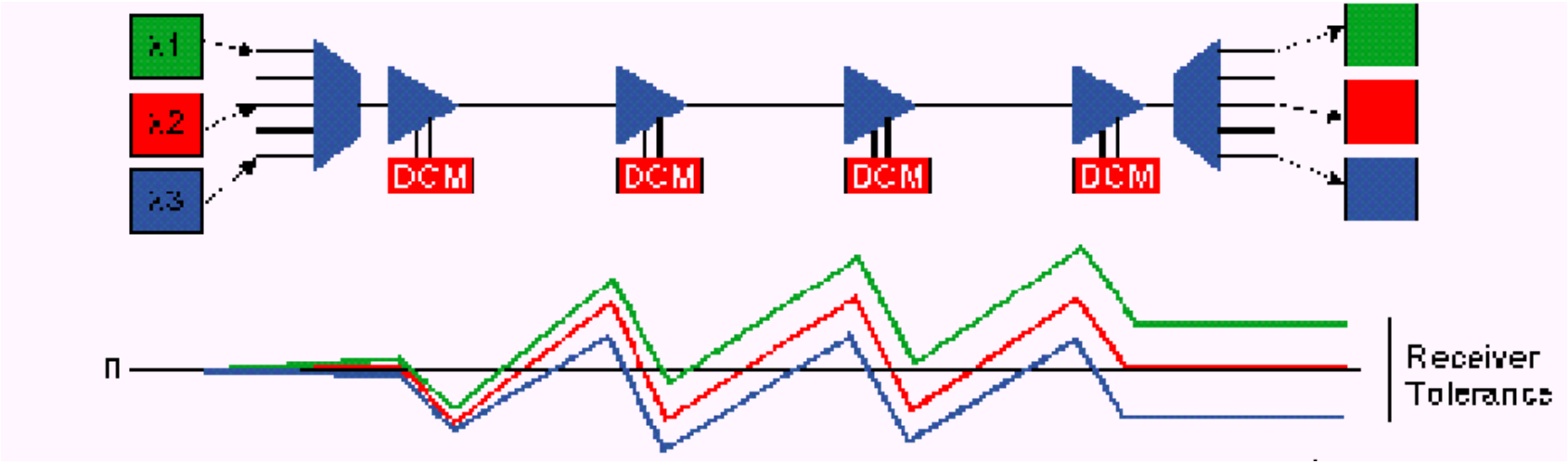
- Repeated from yesterday:
  - Effect that results in pulse broadening, thus limiting the data rate or the transmission distance.
  - Is a quadratic parameter, doubling the data rate deteriorates the tolerance 4 times
  - Is “easily” compensated by introduction of Dispersion Compensation Modules or the newly introduced electronic compensation method.

Static Compensation



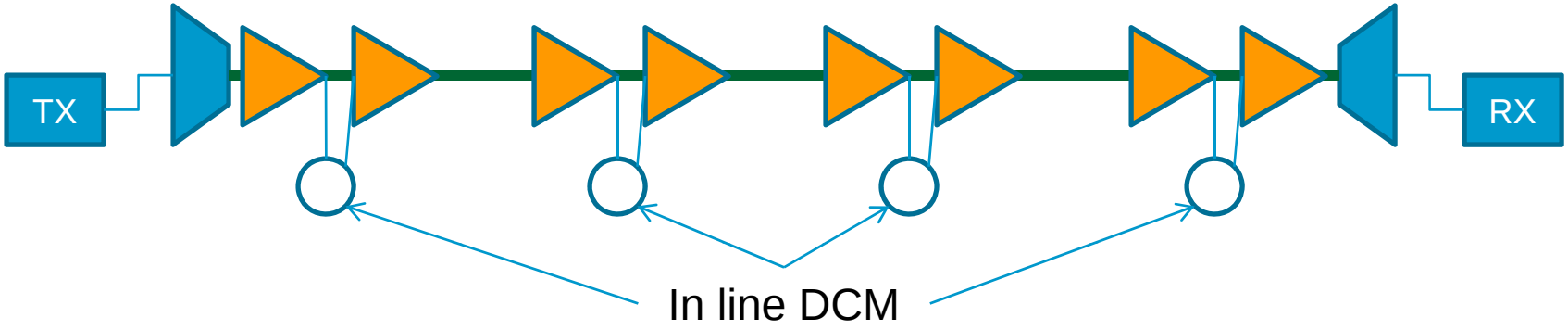
- Classical approach is to distribute the DCMs along the section:
  - Dispersion is never too high before it is compensated
  - Transmission between the amplifiers is done in dispersive environment limiting non linearities.

Static compensation



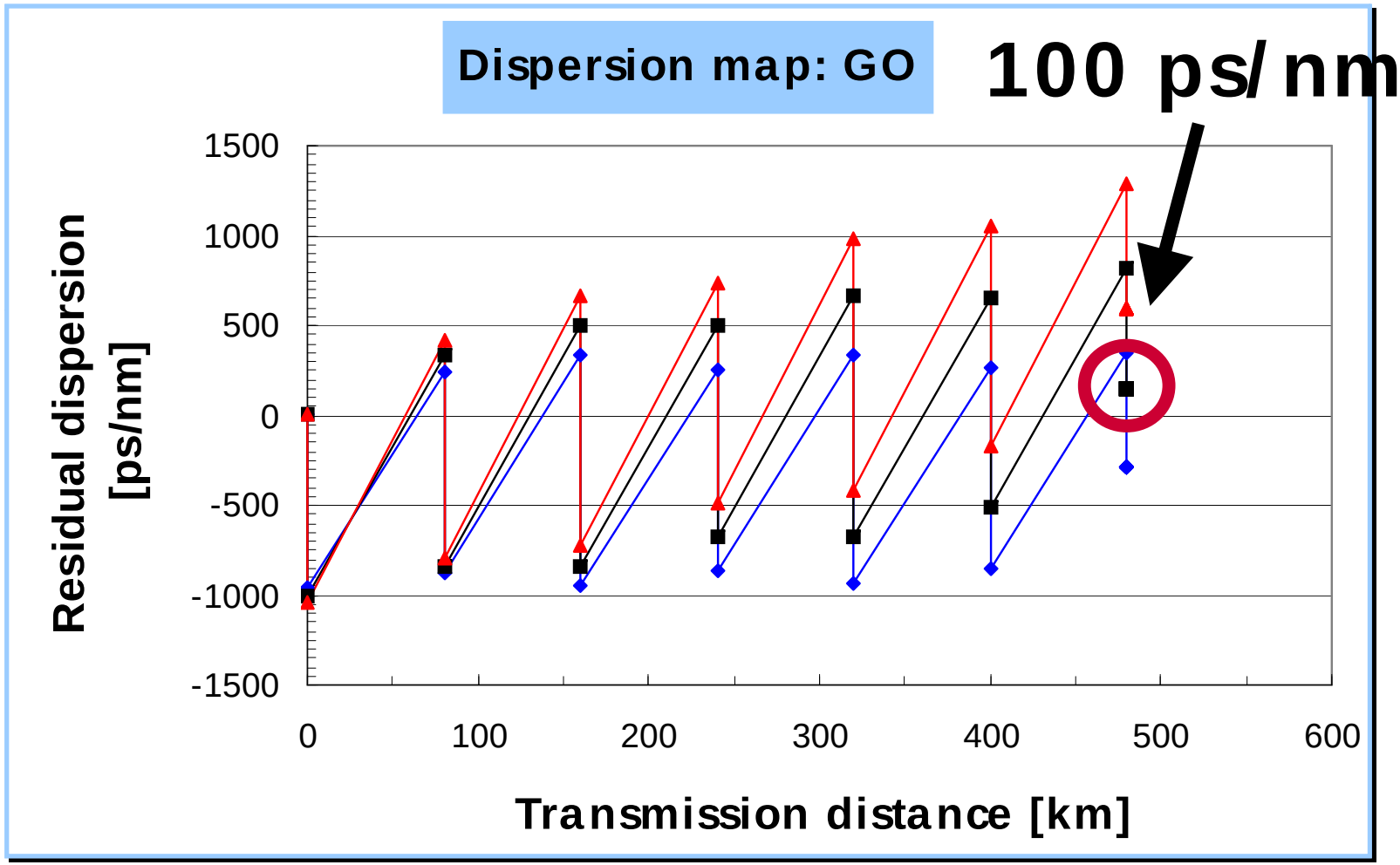
- The fiber dispersion is wavelength dependent – so is the DCM ☹
- The DCMs exibits slope, why perfect compensation for all wavelengths is difficult

Static compensation

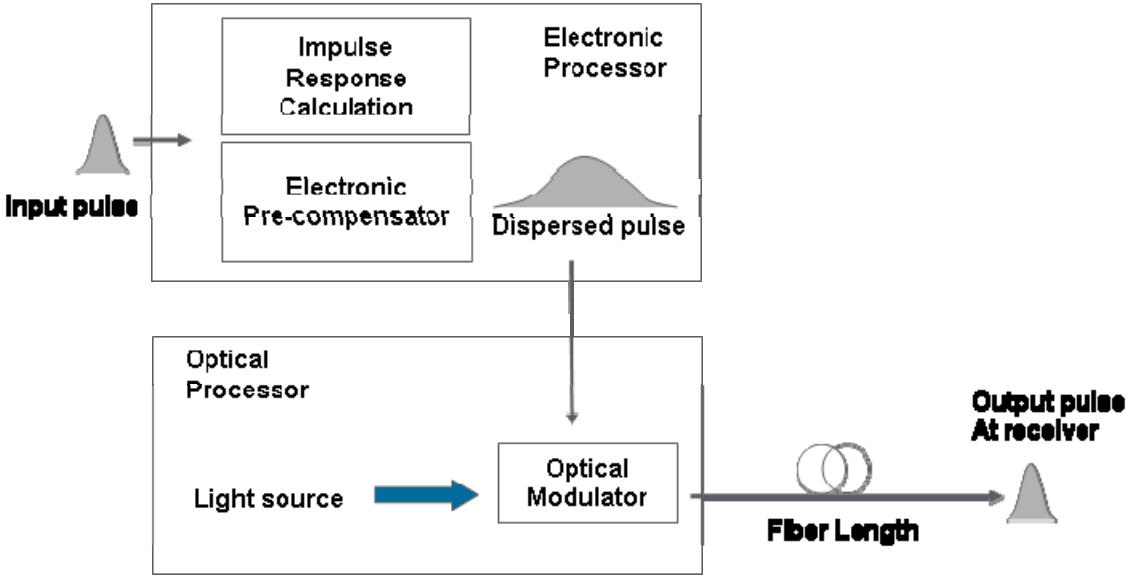


- Insertion of the DCM is not without losses, why DCMs usually is inserted in two stage amplifiers with mid stage access

Static compensation



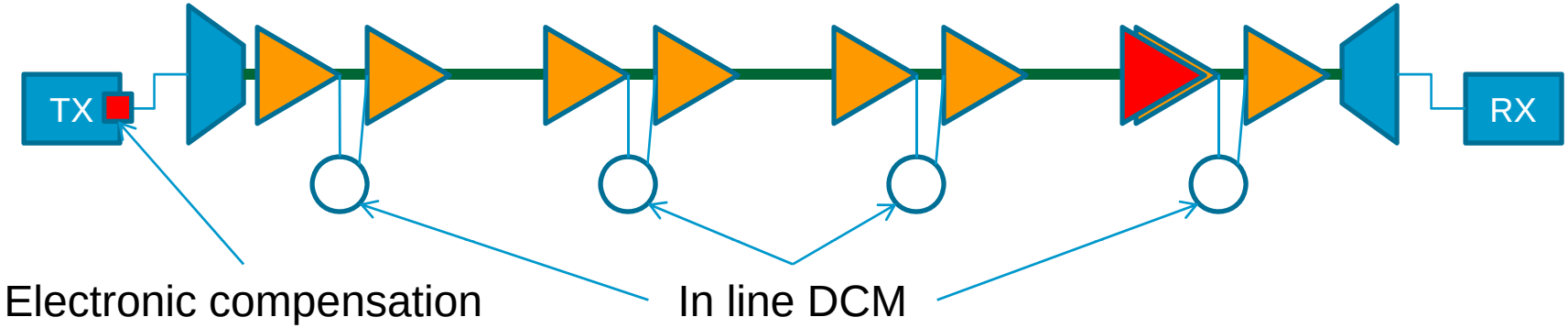
Electronic compensation



- In line DCMs not needed
- Dual stage amplifiers not needed

- Environment not as dispersive as static compensation -> nonlinear effects (XPM, FWM ect.) -> lower launch power!

Electronic compensation



No DCMs – Nice!

Half the amplifiers – Nice!

New amplifier site due to reduced link power budget? ☹

Discussion

- DCMs
  - Robust
  - minimises nonlinearities -> high link budget
  - Costly (DCM, extra amp and manhours)
  - not suited for 10G/40G mixed scenarios
- EDC
  - Flexible
  - Easy setup
  - Reduced power budget
  - Complex

Questions

Thank you