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Changes for the Better

Evaluation of Worst Case Dispersion Penalty of 50Gb/s NRZ for 10 km

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IEEE802.3bs 400GbE Task Force

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Big Ticket Items

-This contribution provides the worst case dispersion penalty for a 10km link using 1.3-µm-wavelength 40Gb/s components.

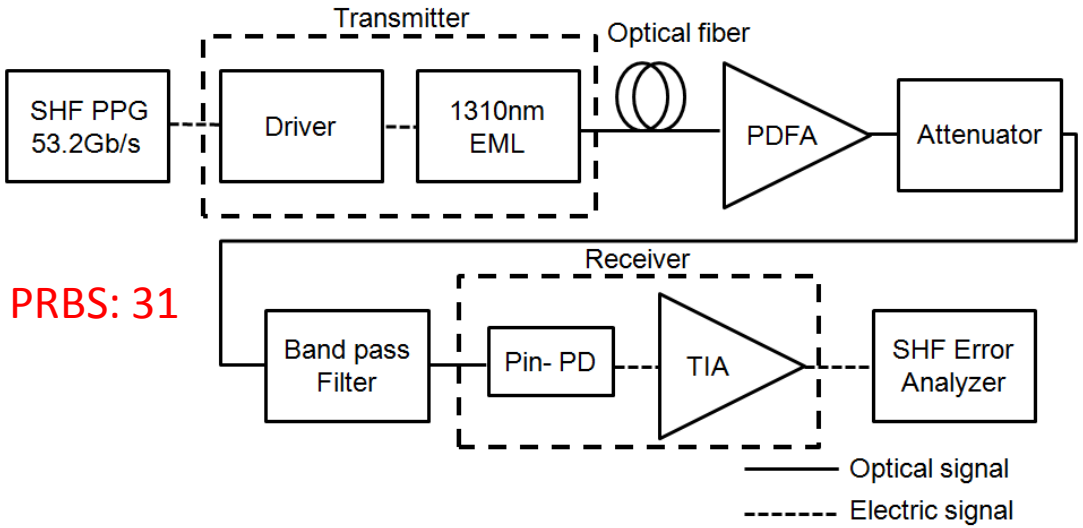
Big Ticket Items – 10km SMF PMD

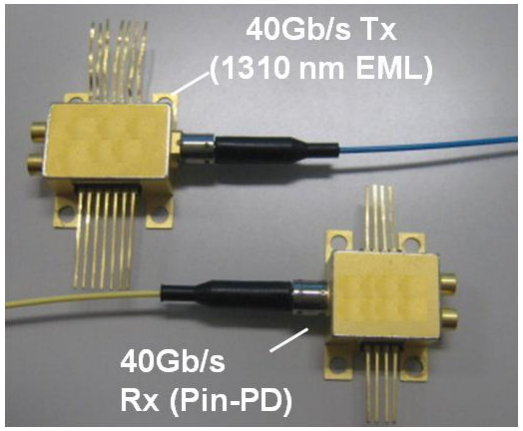
- proposals
  - Kojima_3bs_01a_0115.pdf (NRZ)
- Actions:
  - Evaluate Coupling between electrical and optical interfaces
  - RX Technical feasibility
  - Dispersion penalty worst case (in SMF ad hoc)
  - TDP. MPI
  - RX sensitivity

big_ticket_items_3bs_01_0115.pdf

Measurement setup

-Dispersion penalty of 53.2 Gb/s NRZ was evaluated using 40Gb/s components exceeding the worst case dispersion of the wavelength range
-Dispersion range :-50.8 ps/nm to +9.4 ps/nm (stassar_01_0215_smf.pdf)





- Three kinds of SMF were prepared to cover the LAN-WDM dispersion range.

Dispersion at 1310nm

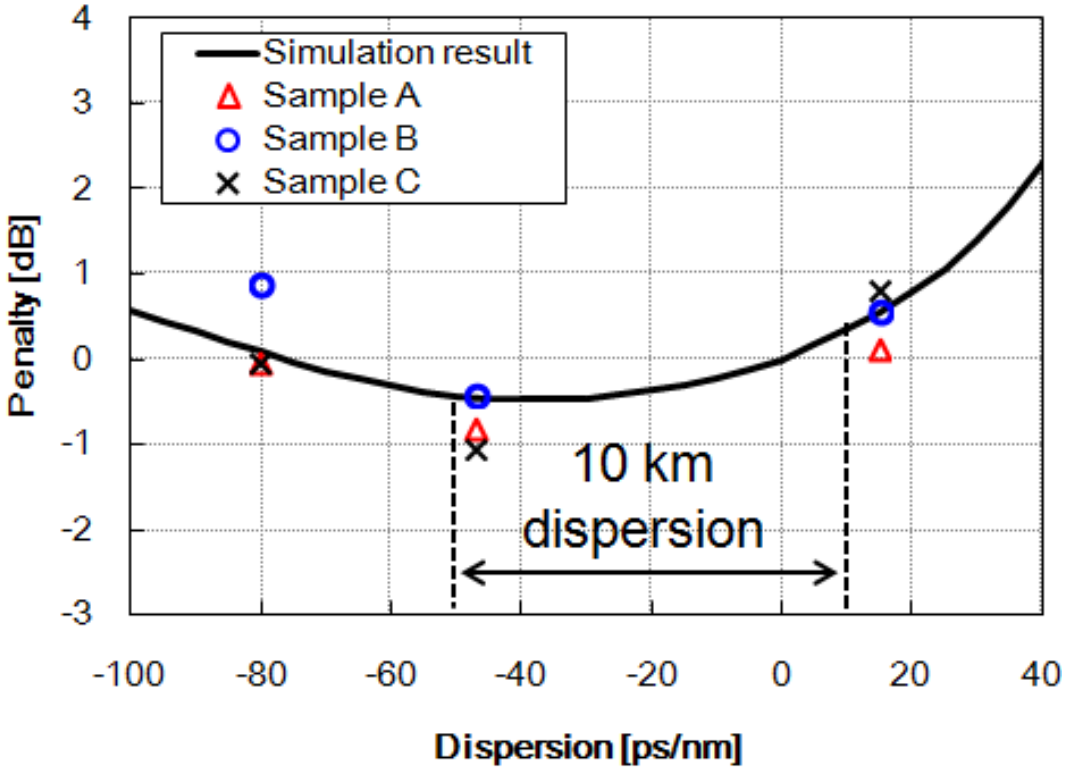
a) +15 ps/nm: Furukawa SMF, 10 km (Specially prepared for 100GBASE-LR4 test)
λ0=1294.1nm, S0=0.093ps/nm2-km, L=10,660m, total dispersion=14.7ps/nm@1309.14nm
b) -47 ps/nm: Corning DSF, 2.25 km
c) -80 ps/nm: TrueWave RS-Fiber, 10km

Transmission test result

-Three-sample results confirmed less than 1dB dispersion penalty over LAN-WDM wavelength range

-The results are align with the simulation results presented in January meeting: kojima_3bs_01a_0115.pdf (shown in the graph)

- We confirmed dispersion penalty worst case of 8 x 50 Gb/s NRZ for a 10km link is less than 1dB



Wavelength:

Sample A : 1310.33nm
Sample B : 1311.14nm
Sample C : 1309.44nm

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Summary

-The worst case dispersion penalties of LAN-WDM 53.2Gbit/s NRZ transmission were experimentally evaluated using 1.3-μm-wavelength EMLs.

- The measurement result showed good agreement with the simulation result.

- The dispersion penalty worst case of 8 x 50 Gb/s NRZ is less than 1dB for a 10km link.