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Update on the impact of CD limits on RX sensitivity penalty and TDECQ measurements

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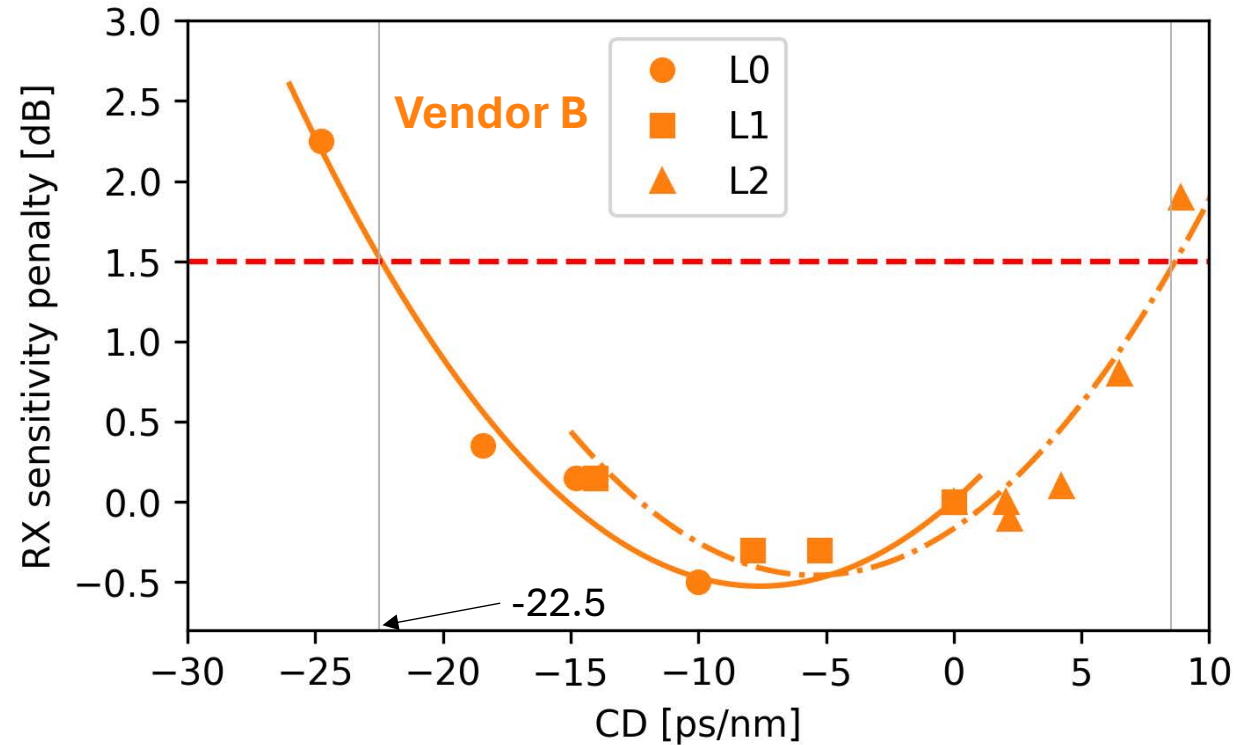
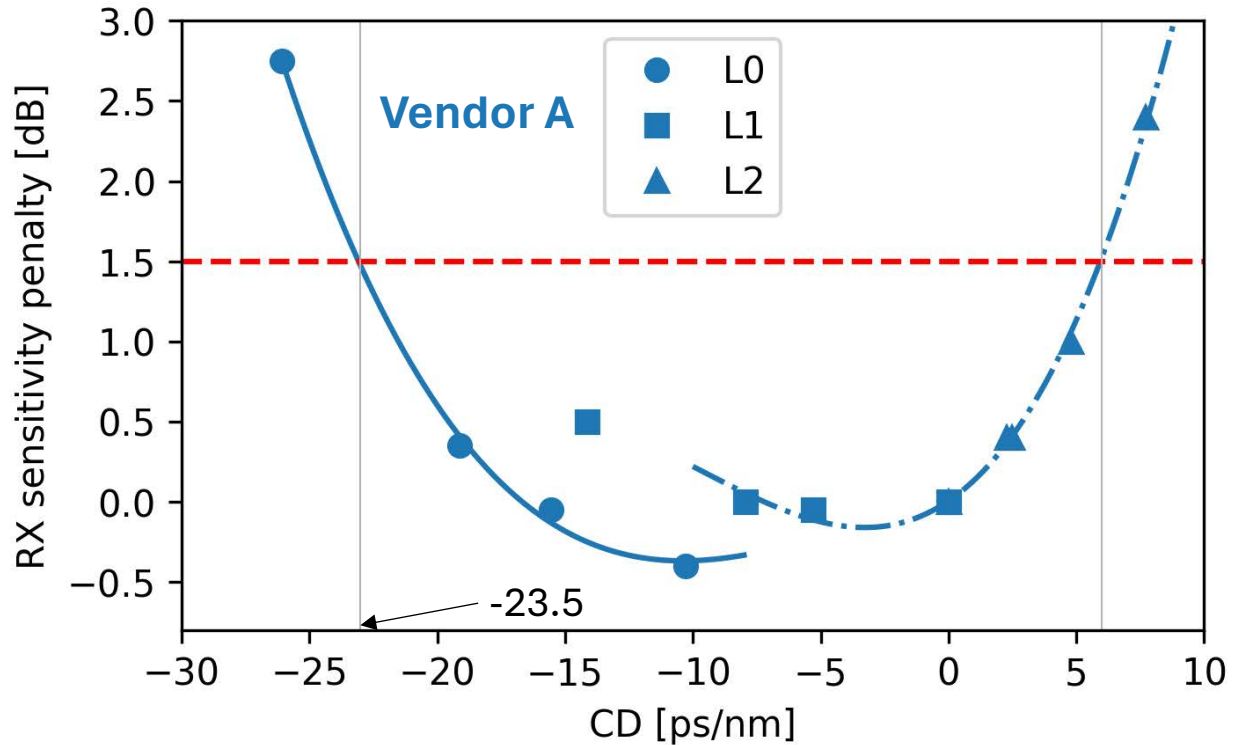


Introduction

- In [fan_3dj_01a_2405](#), we reported the experimentally measured CD tolerance with FFE equalization using one commercial 800G-LR4 OSFP module.
- In this contribution, we repeat the experiments to another 2 modules.
- Also, we experimentally show that the dispersion penalty at CDmin can be reduced by increasing the EML chirp.

Measurements under the factory configurations

- 113GBd Transmitter Module+custom RoSA with FFE



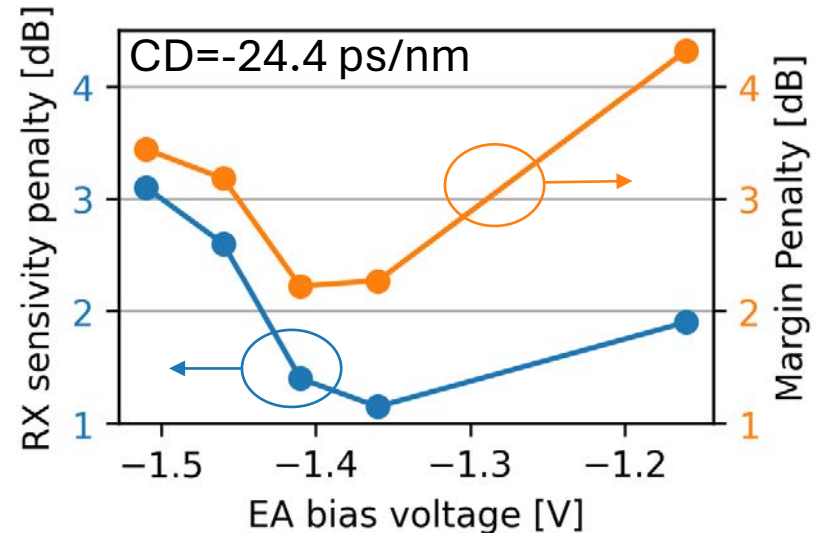
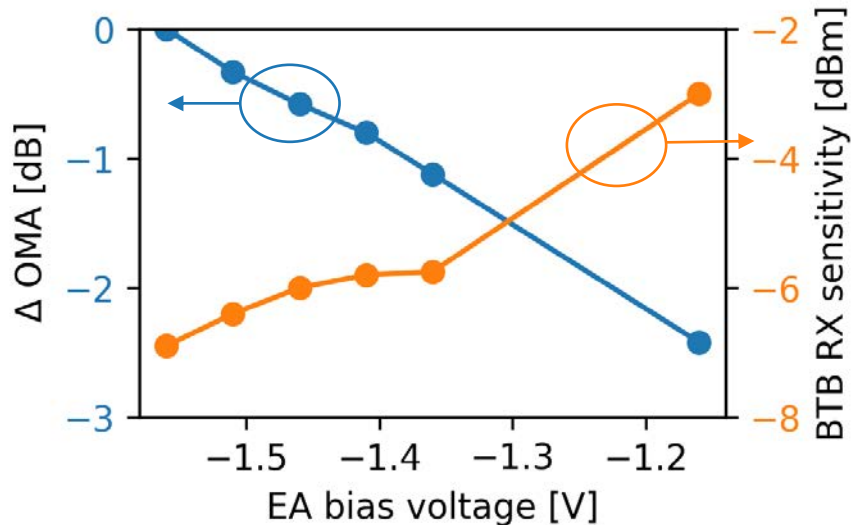
- The RX sensitivity penalty is >1.5 dB when the CD is <-23.5 ps/nm.

EML chirp tuning for reducing the RX sensitivity penalty at CD_{min}

As shown in [johnson_3dj_optx_01_240627](#), the EML chirp is related to EA bias voltage.

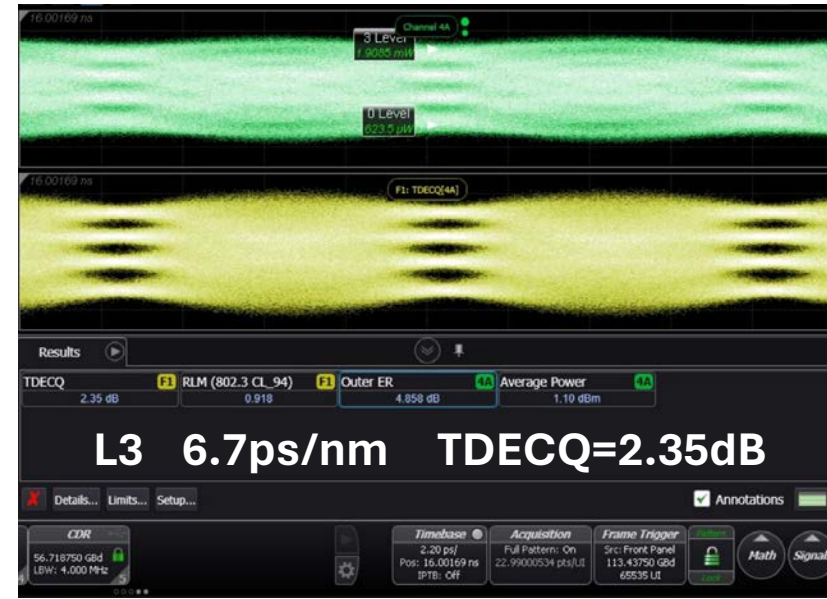
measured from a Vendor A 113GBd module

EA bias voltage [V]	ER [dB]	delta OMA [dB]	Chirp	RX Sen [dBm] (BTB)	RX Sen [dBm] (-24.4 ps/nm)	RX Sen. Penalty [dB] w.r.t. Ref.	Margin Penalty [dB] w.r.t. Ref.
Ref: -1.56	4.624	0.00	Smaller	-6.9	exceeding BER_{ref}	NA	NA
-1.51	4.235	-0.33	↓	-6.4	-3.8	3.1	3.44
-1.46	3.956	-0.58		-6	-4.3	2.6	3.18
-1.41	3.732	-0.80		-5.8	-5.5	1.4	2.2
-1.36	3.445	-1.12		-5.75	-5.75	1.15	2.27
-1.16	2.49	-2.42		Larger	-3	-5	1.9



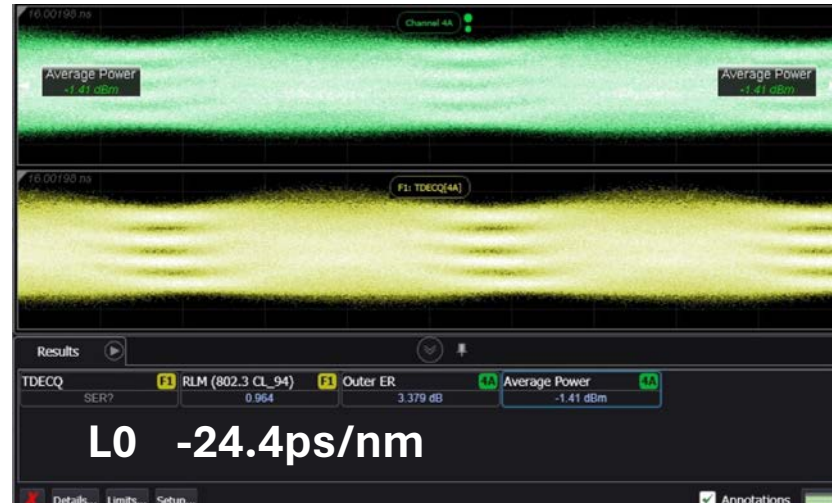
✓ <1.5dB RX sensitivity penalty can be obtained at -24.4ps/nm when the EML chirp is increased.

The impact of CD on current TDECQ measurements



EA bias voltages are set as its reference value

The impact of CD on current TDECQ measurements



EA bias voltage is offset by -0.1v from its reference value

So far, we are unable to measure TDECQ at -24.4ps/nm yet, likely due to equipment limitations. More works are to be done.

Concluding remarks

- We experimentally verify that -24.6ps/nm is acceptable with $<1.5\text{dB}$ RX sensitivity penalty @ $\text{BER}=4.85\text{E}-3$ by optimizing the EML chirp (using FFE only, Rx with stronger equalizer could work with worse link dispersion).
- The TDECQ measurement setup will need to be improved.
- This contribution is for information only