

# Report of 100G-BiDi transmission experiment toward 100G x 1ch 40-km specification

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# Supporters

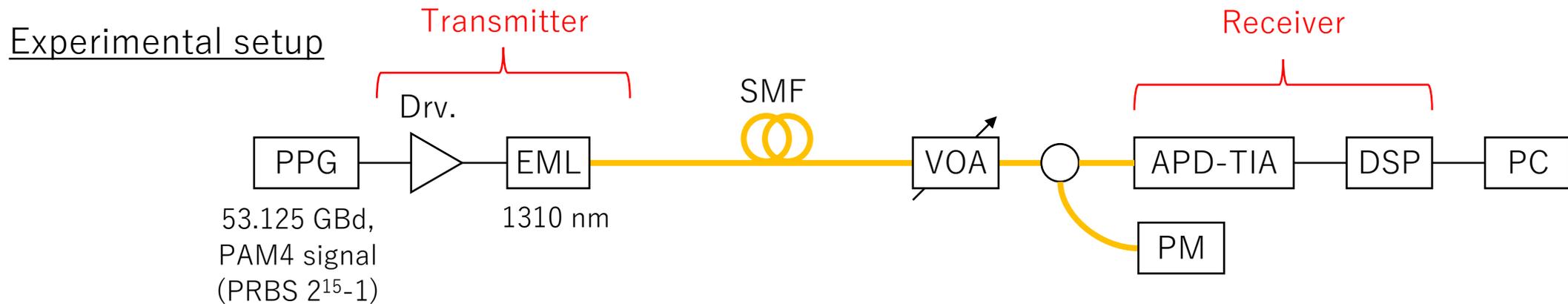
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- Fabrice Bourgart, *Orange*
- John Johnson, *Broadcom*
- Fabio Bottoni, *Cisco*
- Ray Nering, *Cisco*
- Rangchen (Ryan) Yu, *Sifotonics*
- Gupta C Gyaneshwar, *OKI*
- Stefan Dahlfort, *Ericsson*
- Uwe Schmiade, *Nokia*
- Derek Nessel, *Huawei*

# Introduction

- The standardization of 100G-BiDi is being discussed by both IEEE and ITU-T.
- In IEEE, specifications for distance of 10 and 20 km are discussed based on single wavelength channel (1304.6/1309.1 nm). On the other hand, for the 40-km specification, the feasibility of single wavelength channel for a transmission distance of 40-km has not yet been confirmed.
- Before discussing the PMD parameters for 40-km specification, it is necessary to clarify the chromatic dispersion penalty, receiver sensitivity and Tx launch power in market technologies. In addition, the feasibility of 100G/ $\lambda$  transmission should be demonstrated through experiment/simulation.
- This contribution aims to present the experimental results for 100G/ $\lambda$  40-km transmission.

# 100G-BiDi 40-km transmission experiment

- To evaluate the feasibility of 100G-BiDi 40-km, 50 GBd PAM4 40-km real-time transmission experiment was conducted.

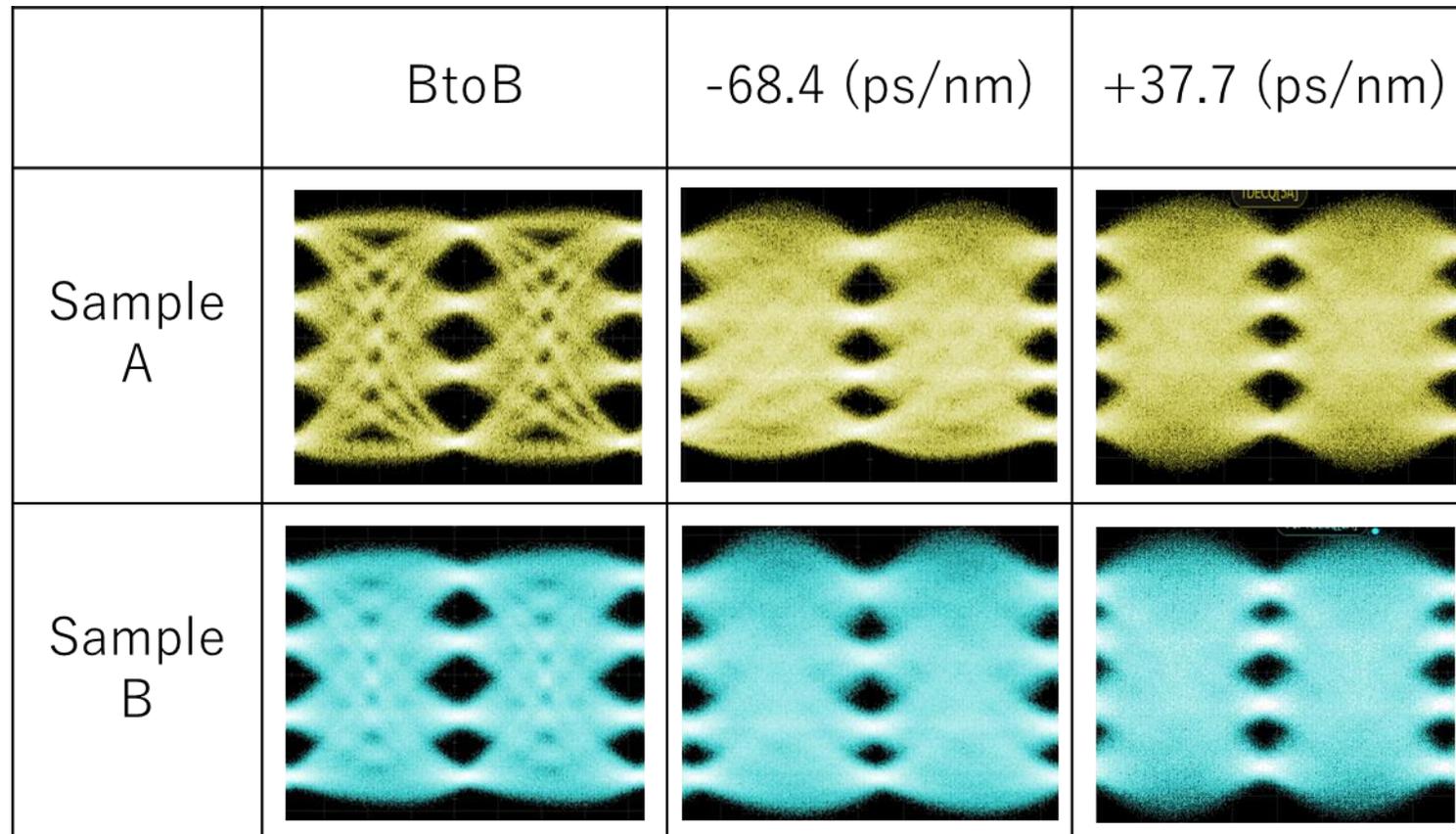


PPG: pulse pattern generator, Drv.: driver, EML: external modulated laser, SMF: single mode fiber, VOA: variable optical attenuator, PM: power meter, TIA: trans impedance amplifier, DSP: digital signal processing

- Investigated effect of chromatic dispersion assuming a wavelength of  $1304.6/1309.1 \pm 1$  nm (-77 to 37 ps/nm)
- Measured BER characteristics, receiver sensitivity (@BER= $2.4 \times 10^{-4}$ )

# Eye diagrams

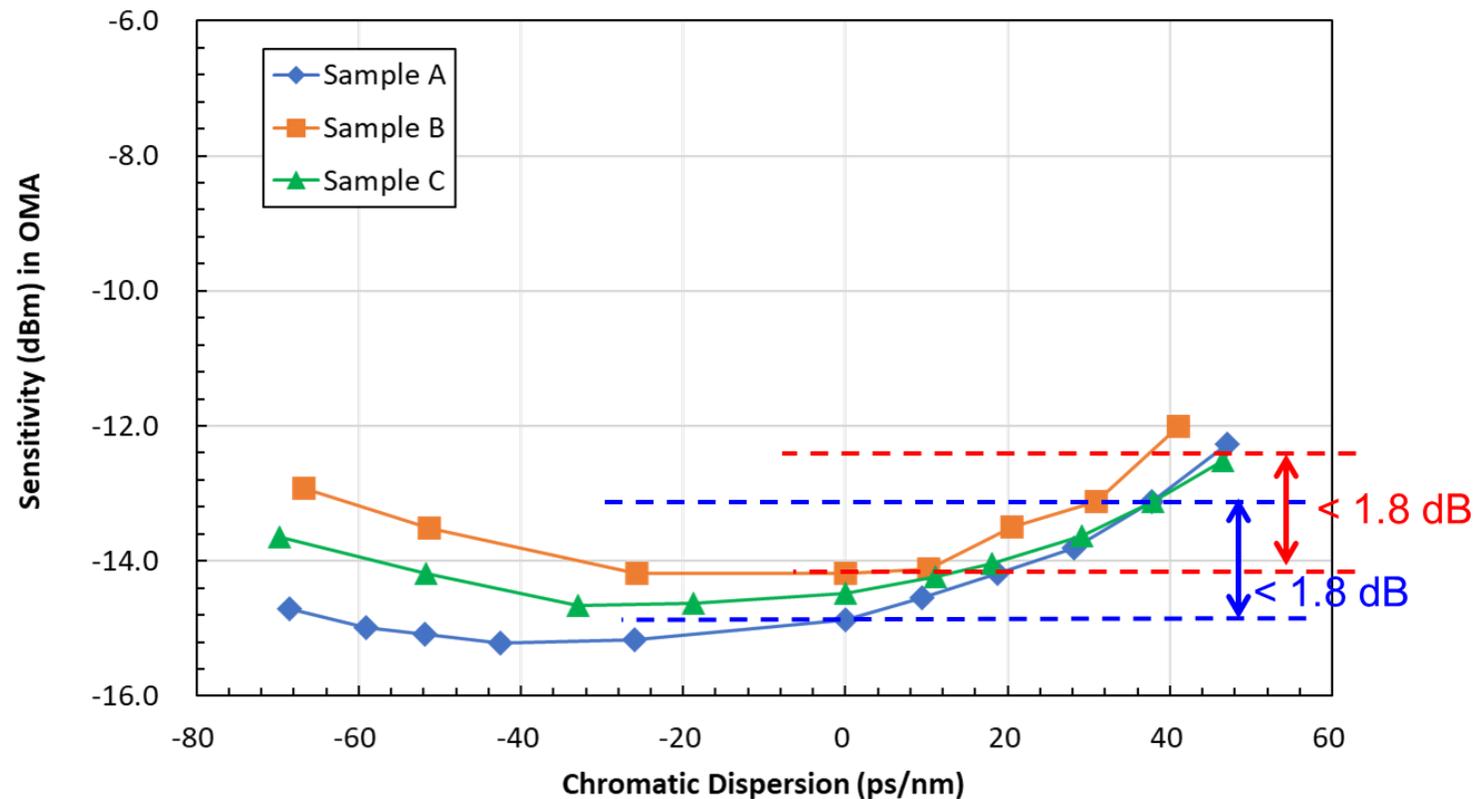
- Good eye openings obtained after the fiber transmission for sample A and B



w/ TDECQ filter

# Receiver sensitivity for chromatic dispersion

- Experimental results demonstrated the feasibility of 100G/ $\lambda$  40-km transmission.



- Receiver sensitivity of -14.2 dBm was achieved for BtoB.
- Chromatic dispersion penalty for -77 to 37 ps/nm was less than 1.8 dB.

# Discussion

- Three EMLs from different vendors were evaluated and the high receiver sensitivity of less than -14.2 dBm and the chromatic dispersion penalty of less than 1.8 dB were achieved.
- From the viewpoint of chromatic dispersion, 100G x 1ch 40-km transmission can be realized.
- Proposal
  - Discussion based on 100 Gbps with single wavelength channel for 40-km specification
  - Same wavelength plan with 10 and 20 km specification (1304.6/1309.1 nm)