Experimental update on PONs with duobinary detection

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Ed Harstead, member Fixed Networks CTO
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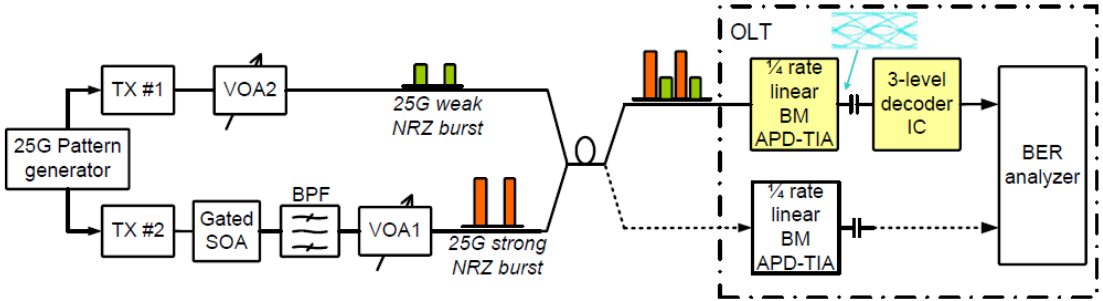
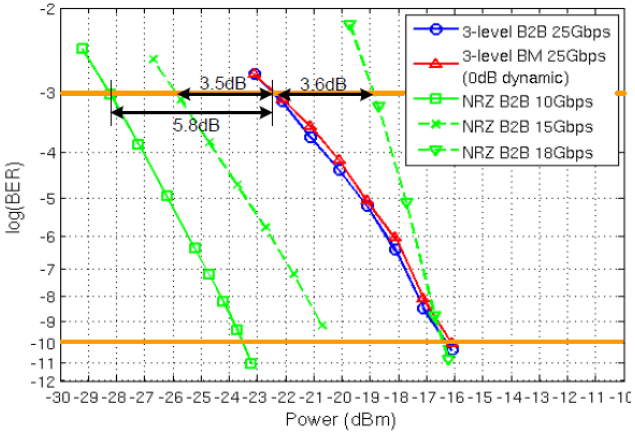
Alcatel·Lucent

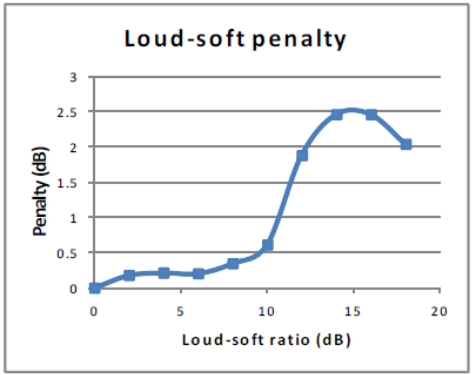
Upstream burst mode duobinary reception, Ghent University INTEC/IMEC

X. Yin, et. al., "25Gb/s 3-level Burst-Mode Receiver for High Serial Rate TDM-PONs", *OFC 2015*.

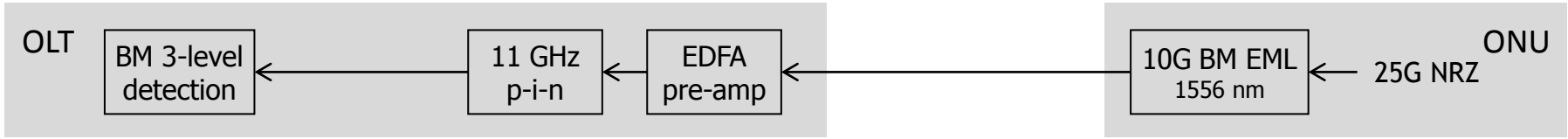


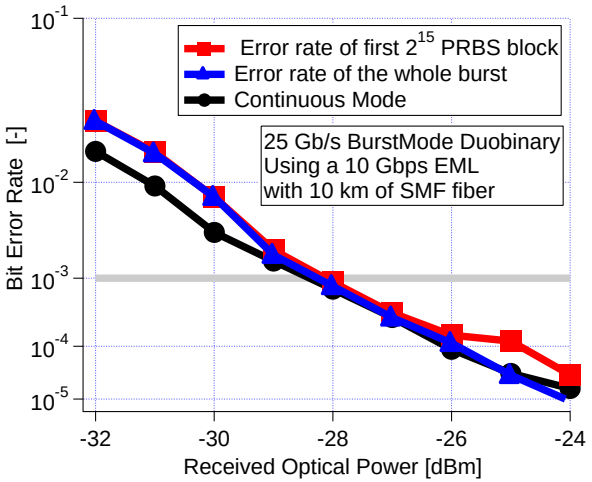
- 25 Gb/s NRZ transmission with duobinary detection (low bandwidth receiver)





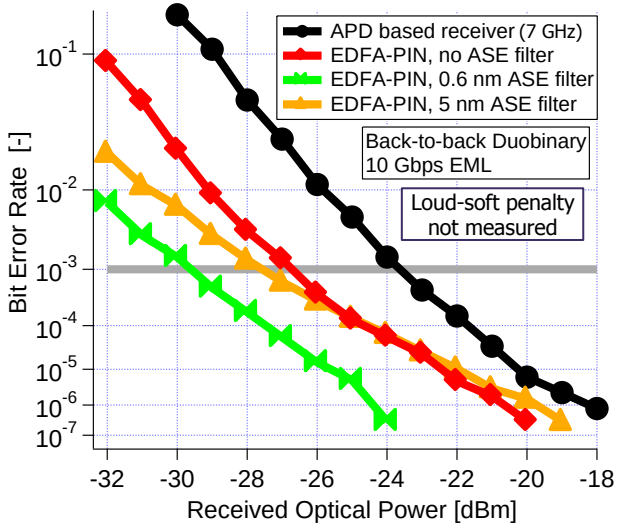
Upstream burst mode duobinary transmission, Bell Labs





Less than 0.5 dB burst mode penalty @10^{-3} BER

EDFA (single pump, 5 nm ASE filter) + p-i-n receiver provides 4 dB improvement over APD @10^{-3} BER

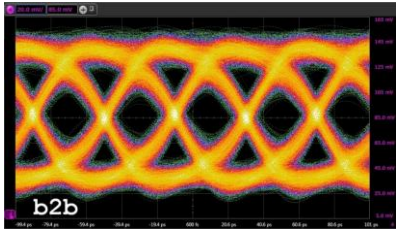


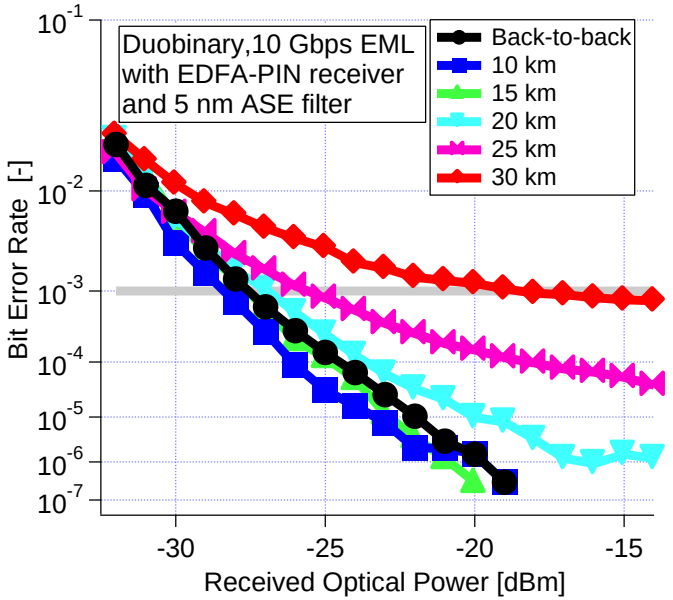
V. Houtsma, D. van Veen, "Demonstration of symmetrical 25 Gbps TDM-PON with 31.5 dB optical power budget using only 10 Gbps optical components", *ECOC post deadline*, 2015

Increasing duobinary dispersion tolerance, Bell Labs

- The 3-level signal is generated by ISI, by both low pass filtering and chromatic dispersion (CD)
- By using less low pass filtering at the receiver, more CD ISI can be tolerated on the fiber

- With 11 GHz receiver, optimal sensitivity is achieved with 10 km of fiber.
- In principle, the receiver bandwidth could be tuned to the ideal OLT-ONU distance.





V. Houtsma, D. van Veen, "Demonstration of symmetrical 25 Gbps TDM-PON with 31.5 dB optical power budget using only 10 Gbps optical components", *ECOC post deadline*, 2015

Every success has its network

Backup

APD and DML frequency responses