Technology Exploration Forum

The (not too distant) future: Terabit Ethernet over Petabit WANs

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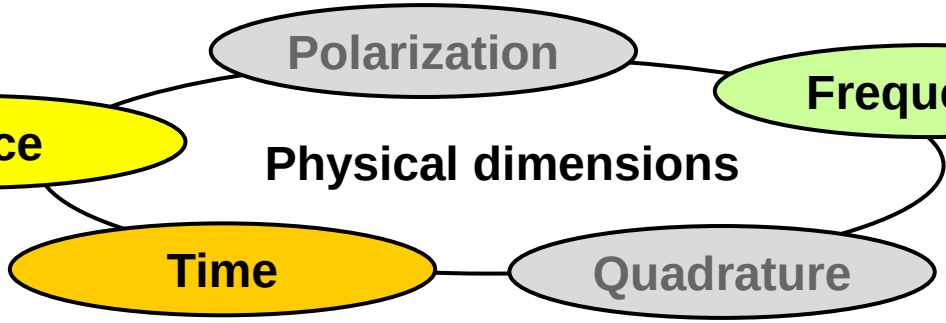
EXPLOITING PHYSICAL DIMENSIONS

CLIENT INTERFACES

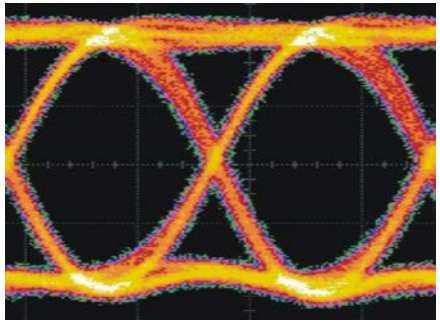
12x12.5G up to ~100 m

10x10G up to ~200 m

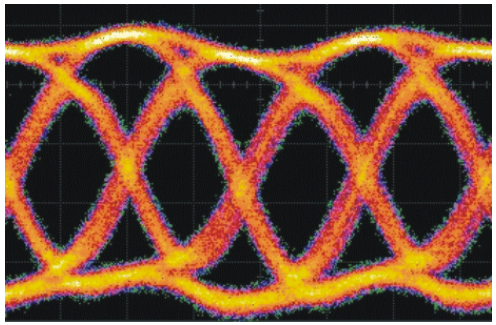


4x25G up to 10 km

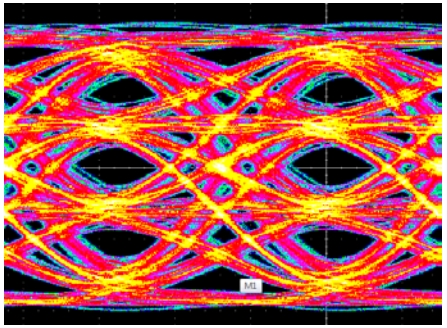
10 Gb/s
25 Gb/s
50 Gb/s



53.5 Gb/s



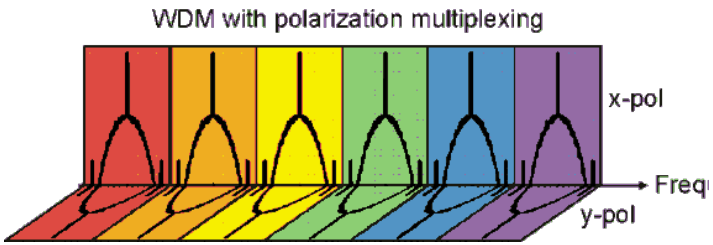
107 Gb/s [Winzer et al., ECOC 2005]

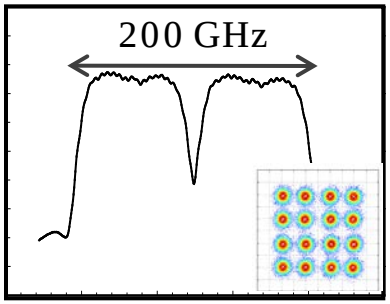


70 GBd, 140 Gb/s Courtesy: Micram

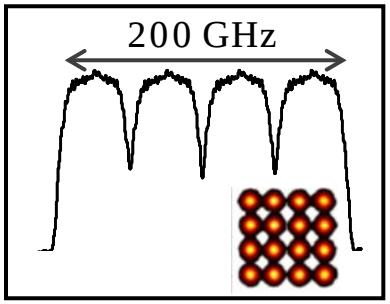
EXPLOITING PHYSICAL DIMENSIONS

LINE INTERFACES

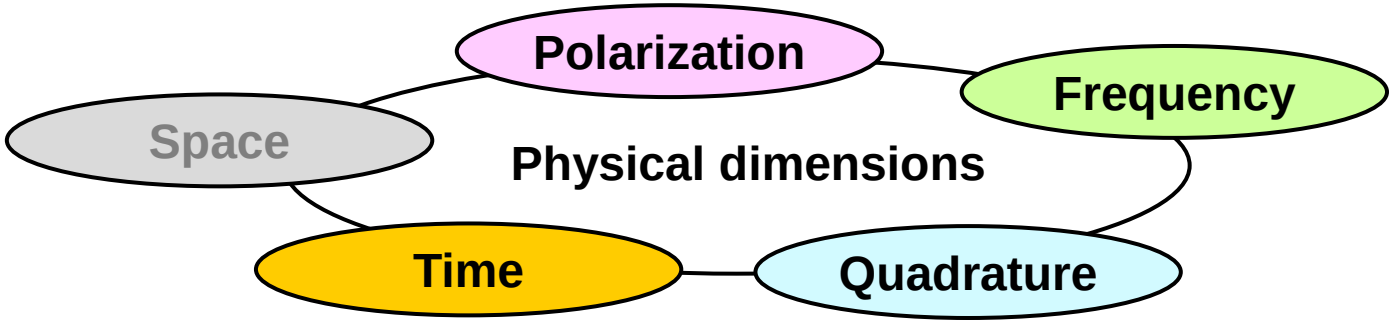


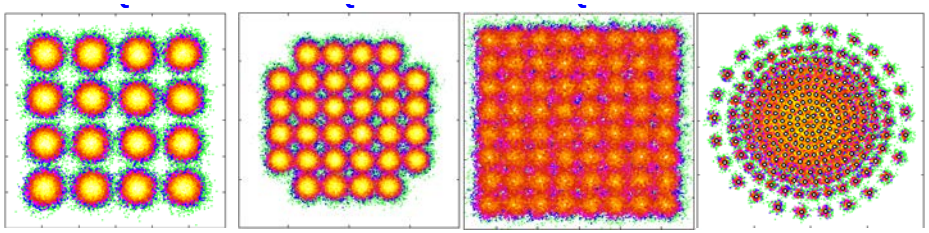


1 Tb/s (2 subcarriers)
[Raybon et al., IPC'12]

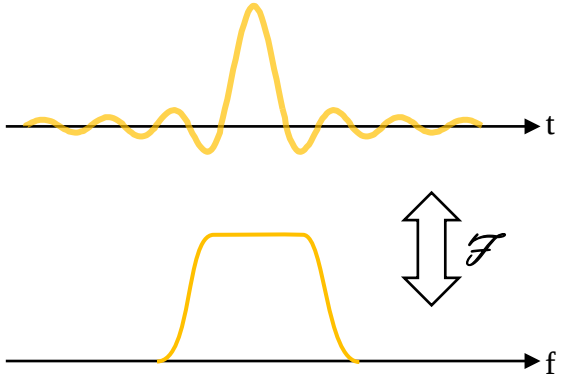


1 Tb/s (4 subcarriers)
[Renaudier et al., OFC'12]

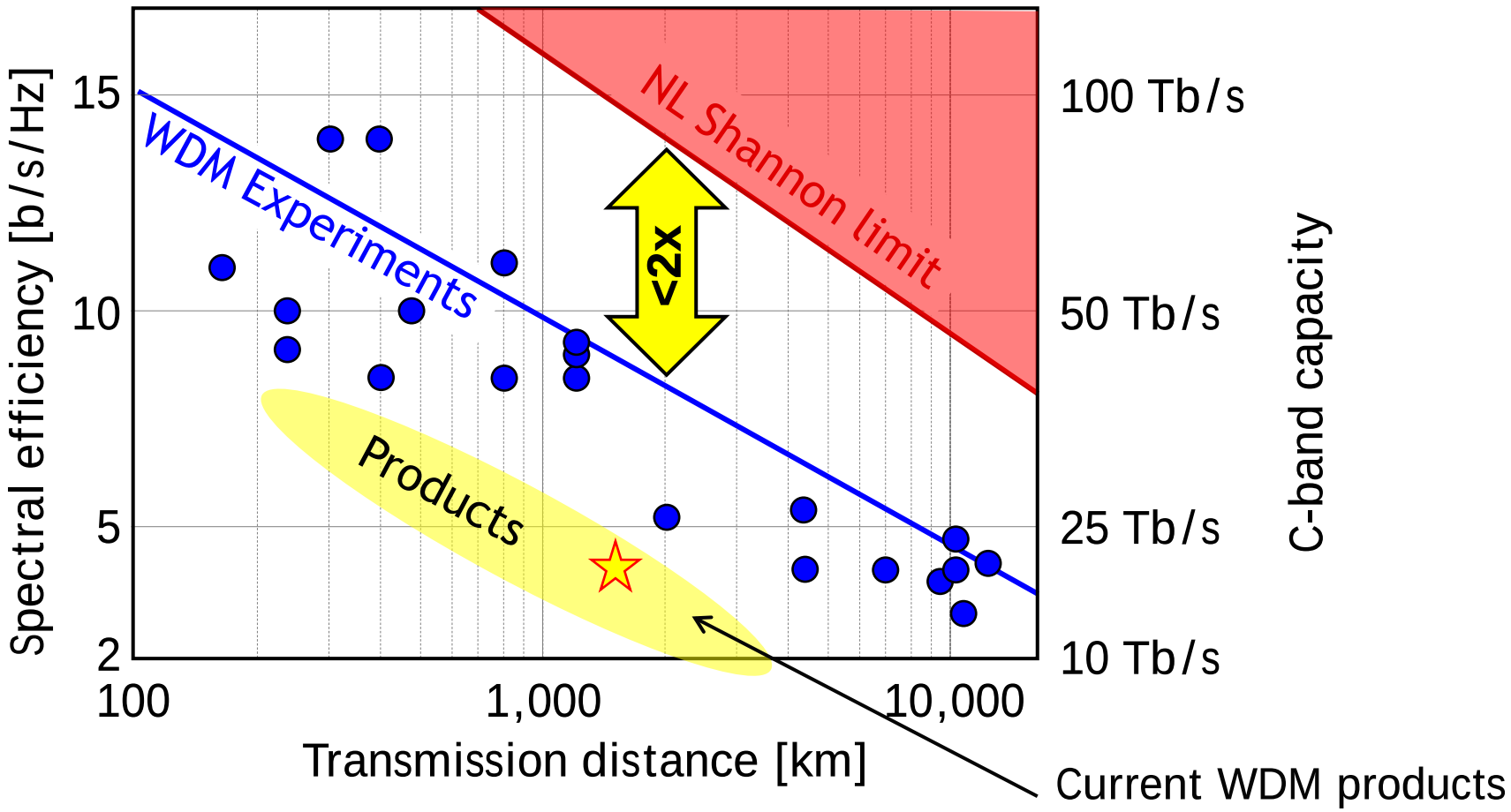




[X. Liu et al., IEEE Sig. Proc. Mag., 2013]

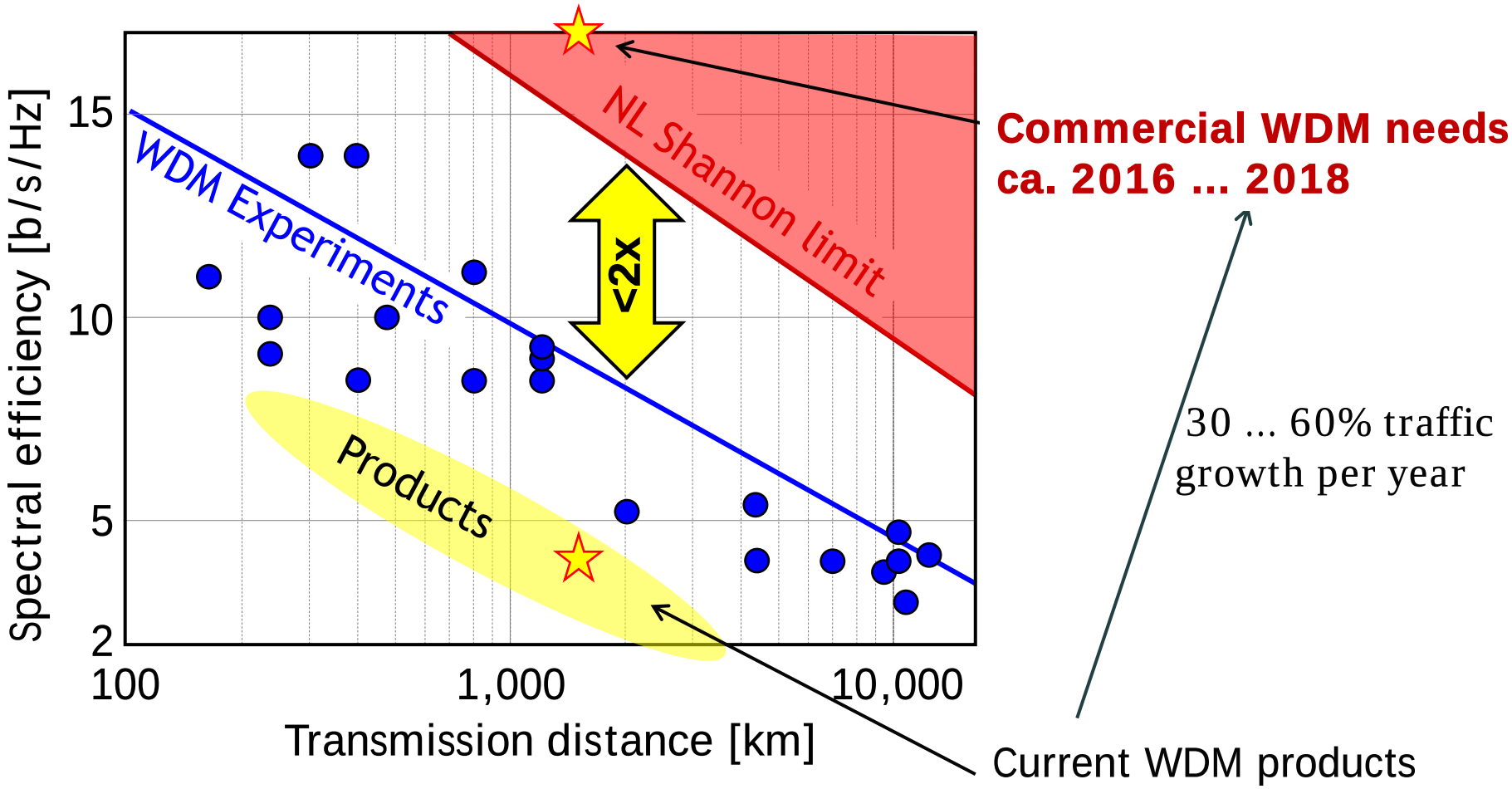


LINE INTERFACES AND THEIR (FUNDAMENTAL) LIMITS



[R.-J. Essiambre et al., J. Lightwave Technol. 28(4), 662 (2010)]
[P. J. Winzer, Phot. Technol. Lett. 23, 851 (2011)]

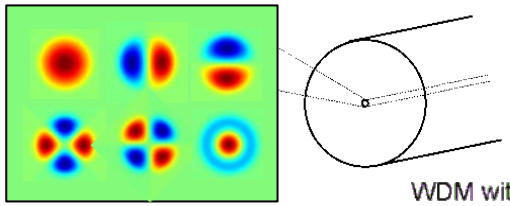
LINE INTERFACES AND TOMORROW'S NEEDS



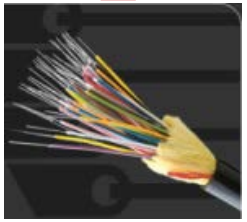
[R.-J. Essiambre et al., J. Lightwave Technol. 28(4), 662 (2010)]
[P. J. Winzer, Phot. Technol. Lett. 23, 851 (2011)]

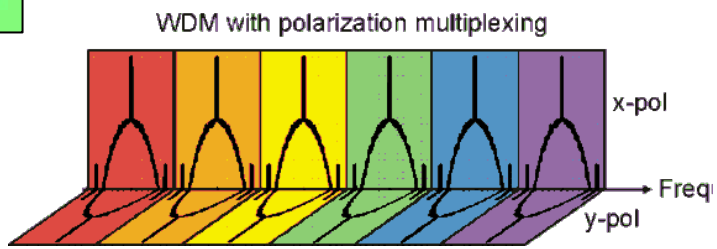
EXPLOITING SPACE: A PARADIGM SHIFT IN THE WAN

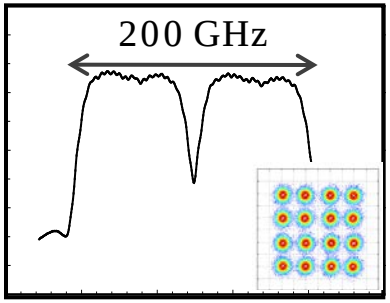
Integration



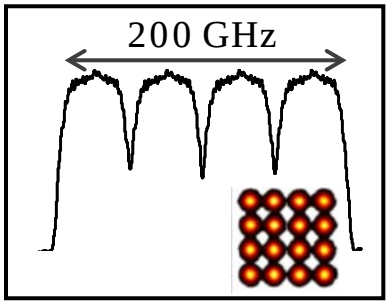
Integration







1 Tb/s (2 subcarriers)
[Raybon et al., IPC'12]



1 Tb/s (4 subcarriers)
[Renaudier et al., OFC'12]

Polarization

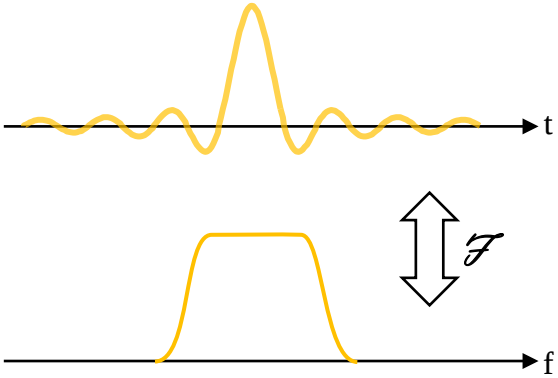
Frequency

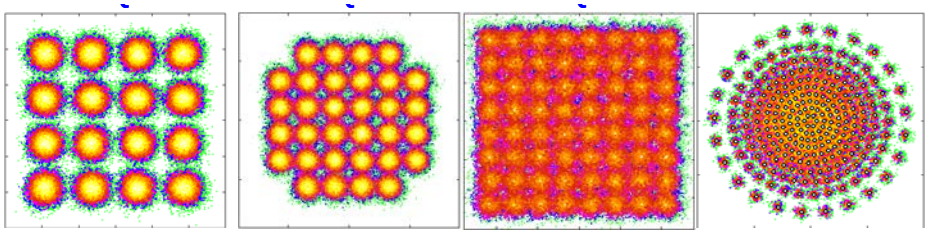
Space

Physical dimensions

Time

Quadrature





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