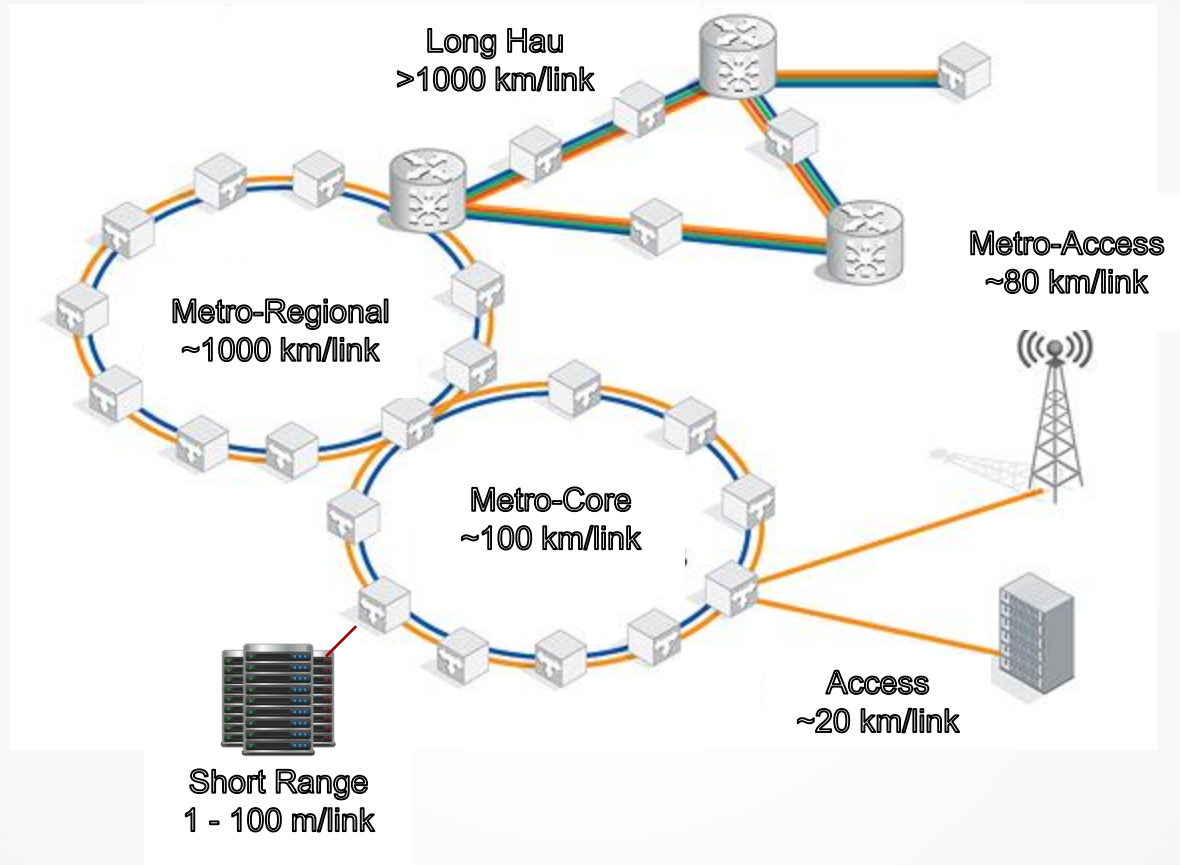


Impairment mitigation in high capacity optical fiber data links

Miguel Iglesias Olmedo

Overview of the Internet



↓ Cost ↓ Power ↓ Size ↑ Capacity

The trade-offs

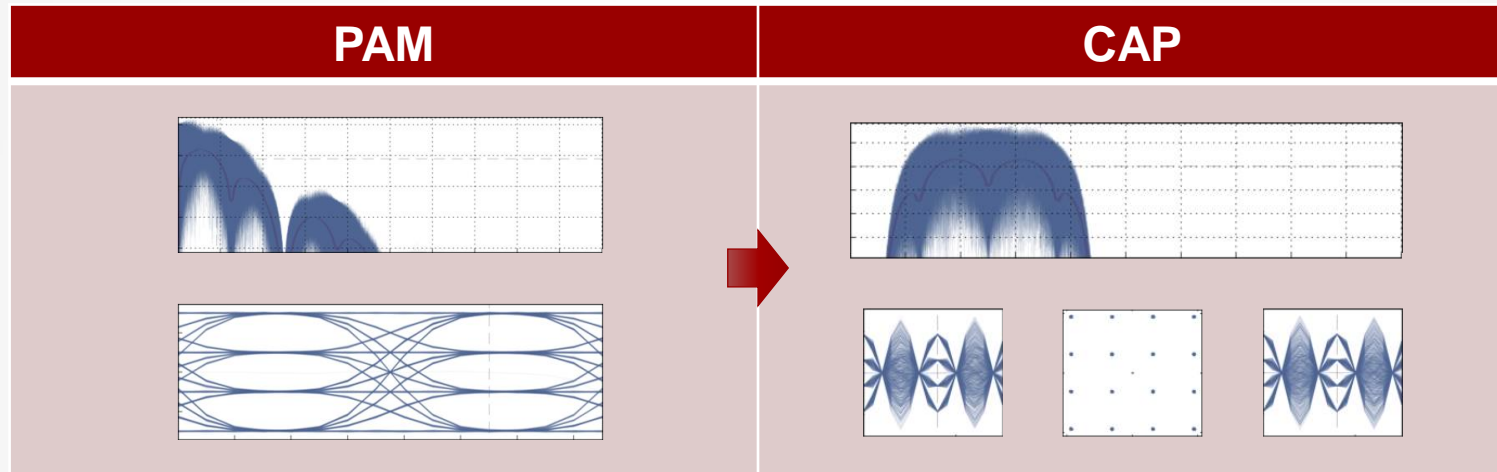
	Short Range	Access	Metro-regional	Metro-core	Long haul
Importance	Cost Power Size Capacity	Cost Capacity Power Size	Capacity Cost Size Power	Capacity Size Power Cost	Capacity Size Power

The Impairments

Short Range	Access	Metro-regional	Metro-core	Long haul
<ul style="list-style-type: none"> Electrical Bandwidth Multi Mode Dispersion 	<ul style="list-style-type: none"> SNR Back-scattering 	<ul style="list-style-type: none"> Dispersion-induced power fading OSNR 	<ul style="list-style-type: none"> Optical Bandwidth OSNR Phase noise 	<ul style="list-style-type: none"> Non Linearities OSNR Phase noise

Proposed Solutions

Short Range

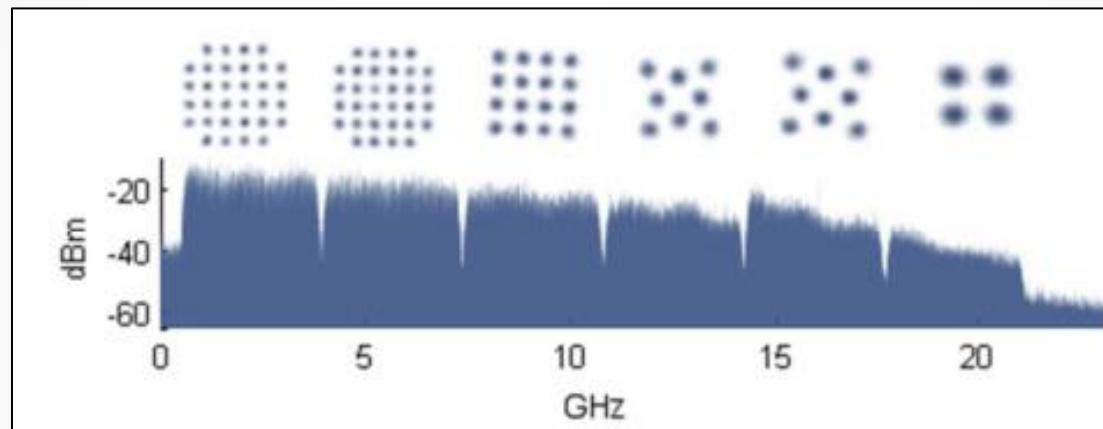


2x Capacity
 MMD Tolerant
 same BW & SNR Sensitivity as PAM

Proposed Solutions

Short Range

MultiCAP

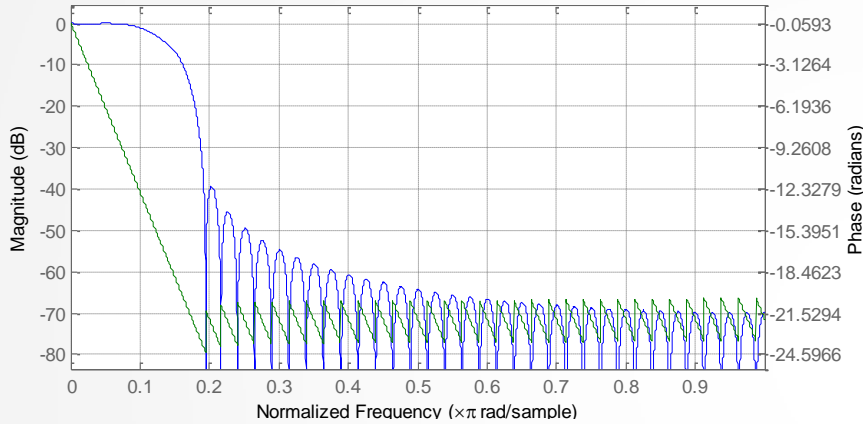


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- [4] M. Iglesias Olmedo, A. Tatarczak, T. Zuo, J. Estaran, X. Xu, and I. Tafur, "Towards 100 Gbps over 100m MMF using a 850nm VCSEL," *OFC*, no. 1, p. M2E.5, 2014.
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- [6] J. Estaran, M. I. Olmedo, D. Zibar, X. Xu, and I. T. Monroy, "First Experimental Demonstration of Coherent CAP for 300-Gb / s Metropolitan Optical Networks," no. 1, pp. 8–10, 2014.

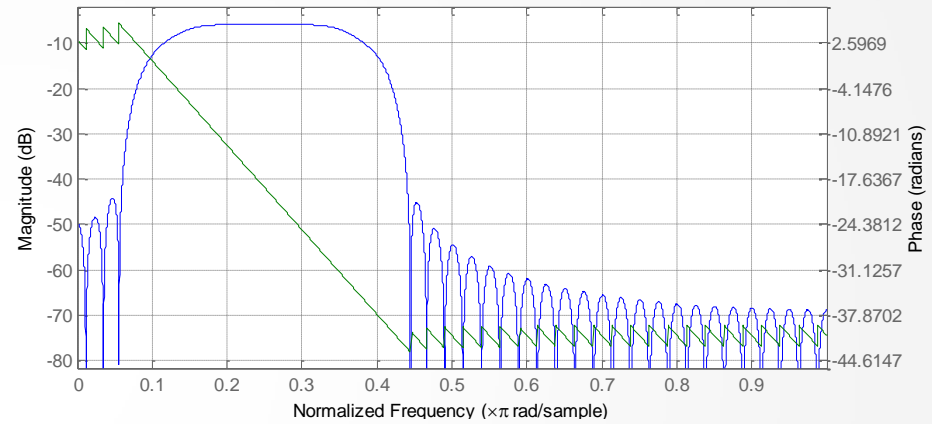
Proposed Solutions

Analog CAP filters?

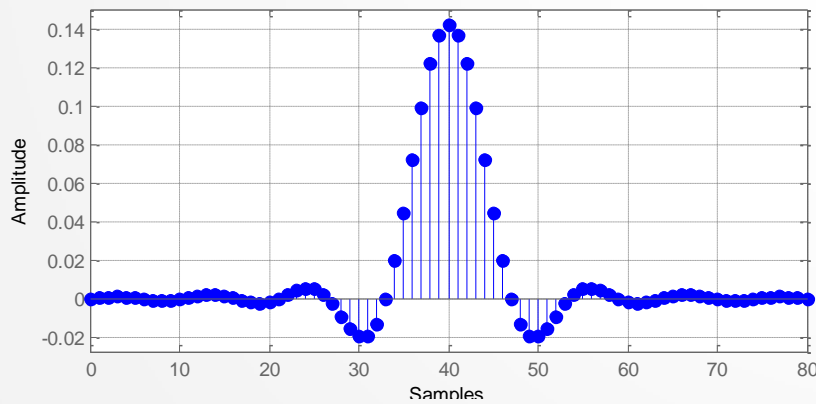
Magnitude Response (dB) and Phase Response



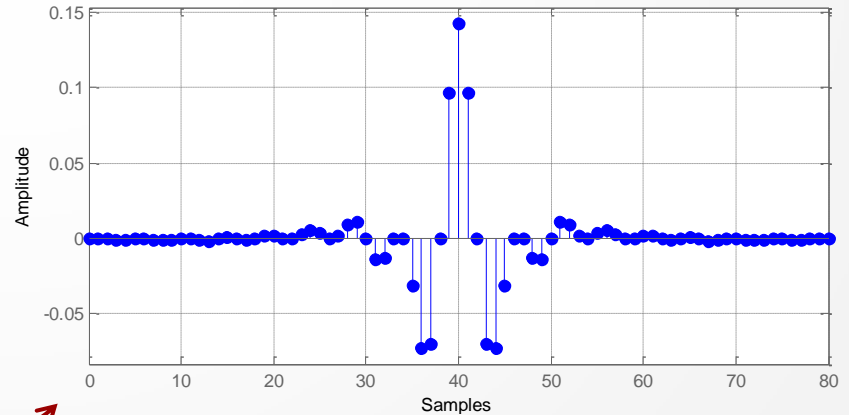
Magnitude Response (dB) and Phase Response



Impulse Response



Impulse Response

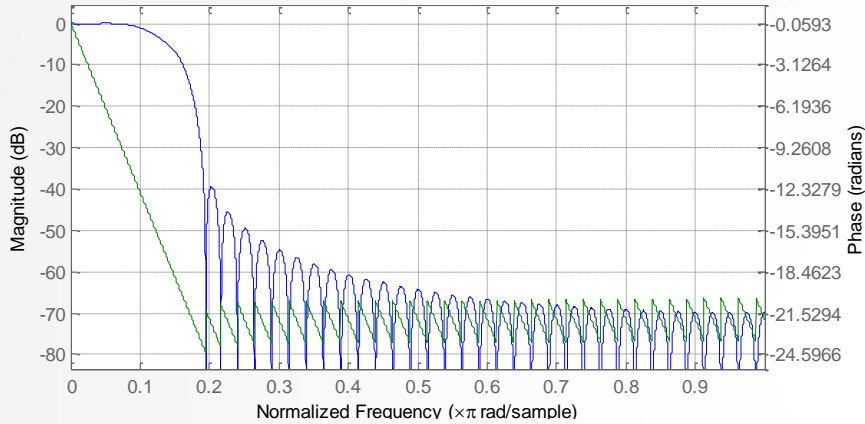


 $\sin(f_c t)$

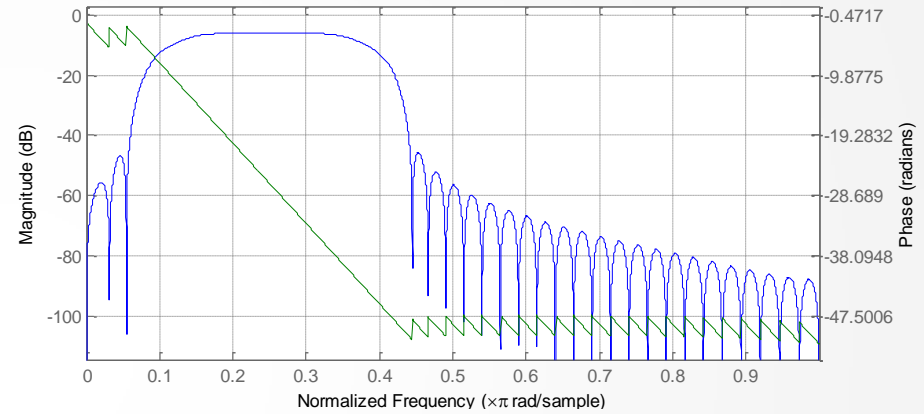
Proposed Solutions

Analog CAP filters?

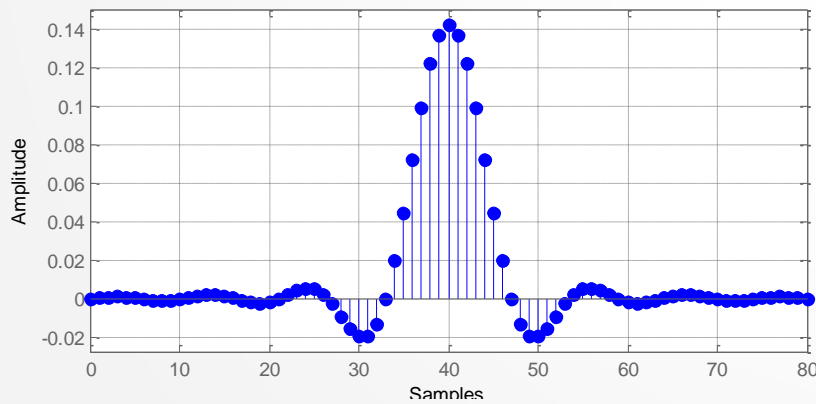
Magnitude Response (dB) and Phase Response



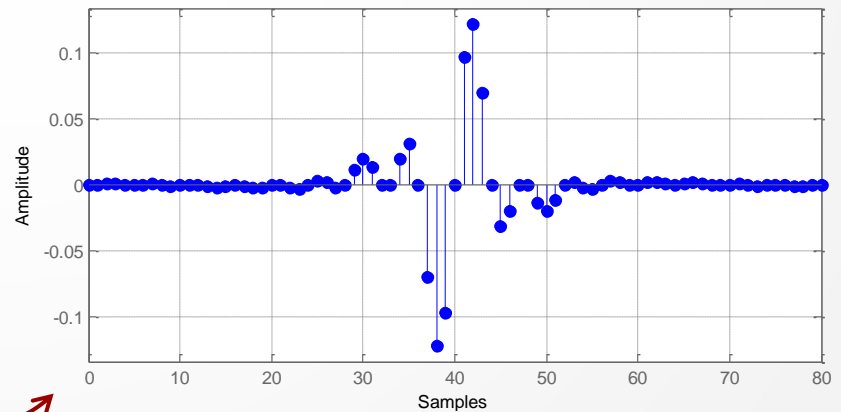
Magnitude Response (dB) and Phase Response



Impulse Response



Impulse Response



~~$\cos(f_c t)$~~

THANK YOU

METRO-ACCESS
& SHORT RANGE SYSTEMS

