

# Cabling Parameters

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  - General Cable
  - Intertek
  - OCC
  - Panduit
  - Psiber
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  - Fluke Networks

# Cabling Parameters

- These cabling parameters are being provided to IEEE to help speed the progress in developing cabling for NGBASE-T.
- This contribution represents the personal view of the author.
- This contribution is not a TIA liaison report, or an official statement from TIA.
- From <http://www.ieee802.org/3/minutes/jul12/incoming/Jul%202012%20TIA%20Liaison%20Presentation.pdf> (slide 9), the TIA is working on a new cabling system.
  - ISO is also working on this.
- While TIA has made assumptions on length, upper frequency, and other items, it is recognized that the IEEE study group has not had any meetings yet, and all assumptions are subject to change.
  - We would like to know your views on these matters!
- All equations in this contribution come from a preliminary TIA draft, and are subject to change.

# Channel Insertion Loss

$$IL := \frac{L + 2}{100} \cdot \left( 1.8 \cdot \sqrt{f} + 0.005 \cdot f + \frac{0.25}{\sqrt{f}} \right) + 2 \cdot IL_{\text{conn}} + \left( 1.8 \cdot \frac{1.8}{100} \right) \cdot \sqrt{f}$$

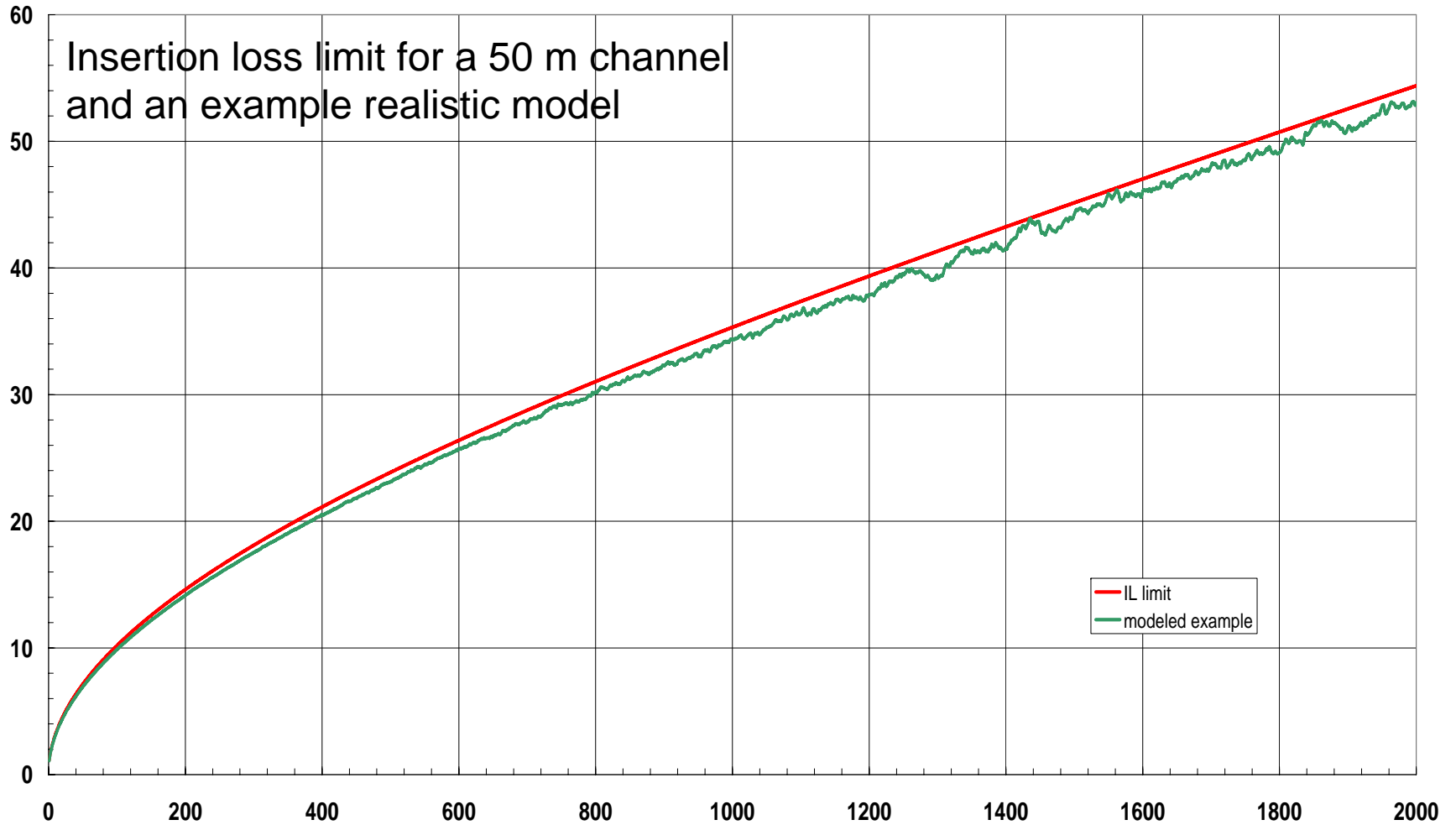
$$IL_{\text{conn}} := .008 \sqrt{f} + .00029 \cdot f + 0.5 \cdot 10^{-6} \cdot f^2$$

This equation is provided as a function of length, and calculations for the graphs below are made based on a 50 m length, plus other lengths.

Note: L is the channel length, which is comprised of a 10 m cord length + the permanent link length. Insertion Loss of the cords are assumed to be 20% higher than the Insertion Loss of the horizontal cable

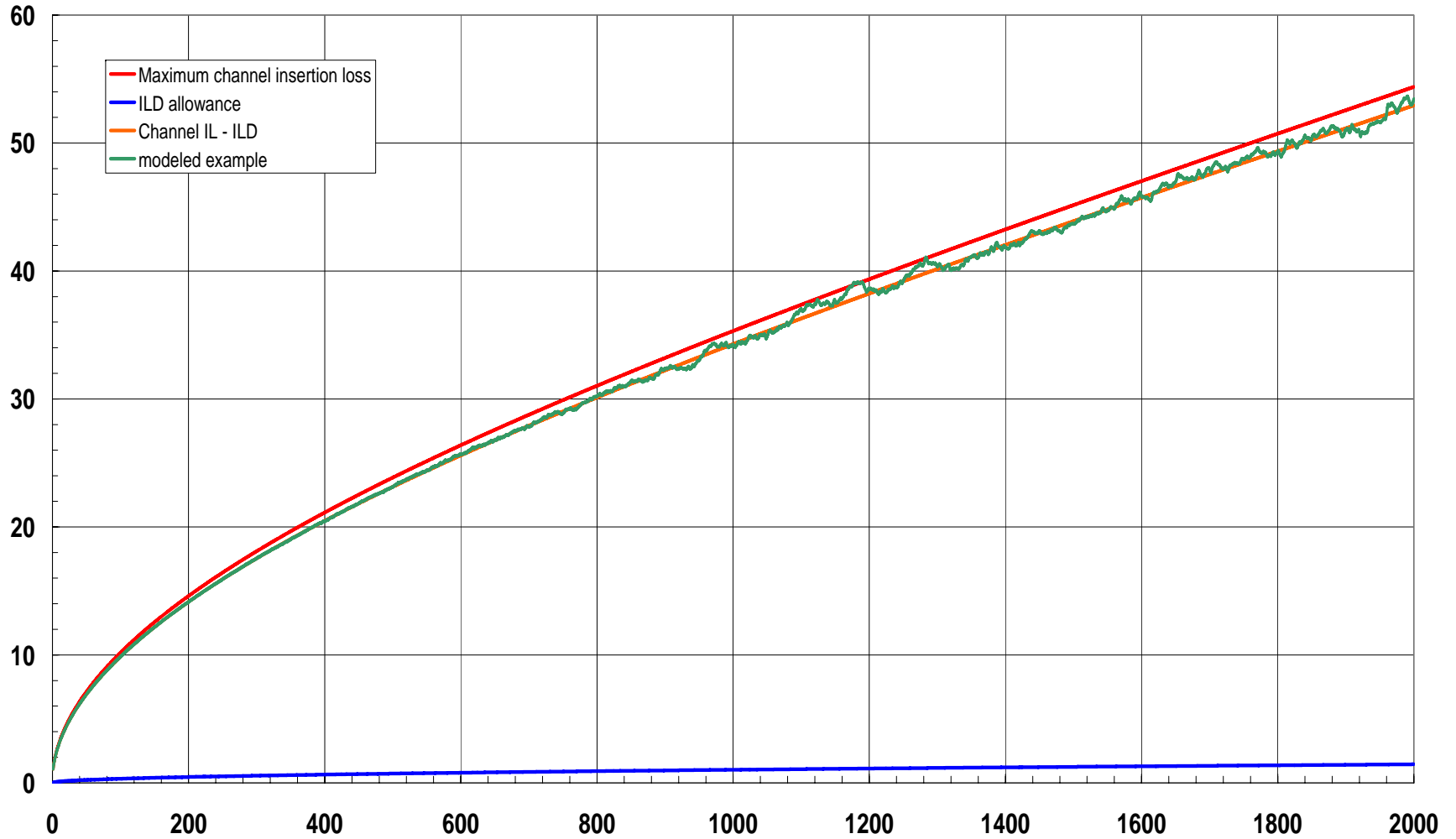
Please refer to the executable file (reference needed) to calculate insertion loss at any length.

insertion loss  
modeled 50 m channel

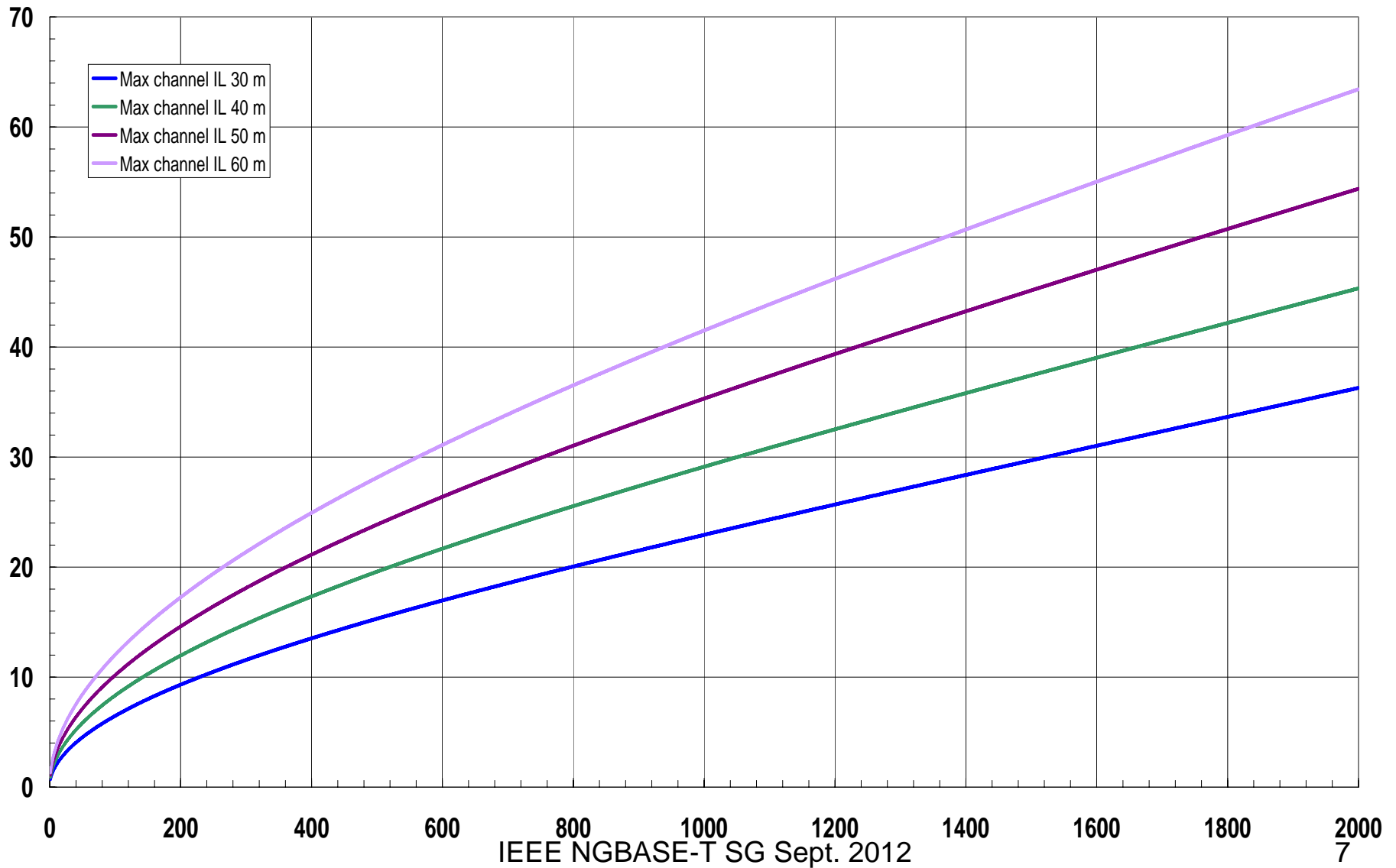


# Effect of ILD

Insertion loss  
2 connector channel

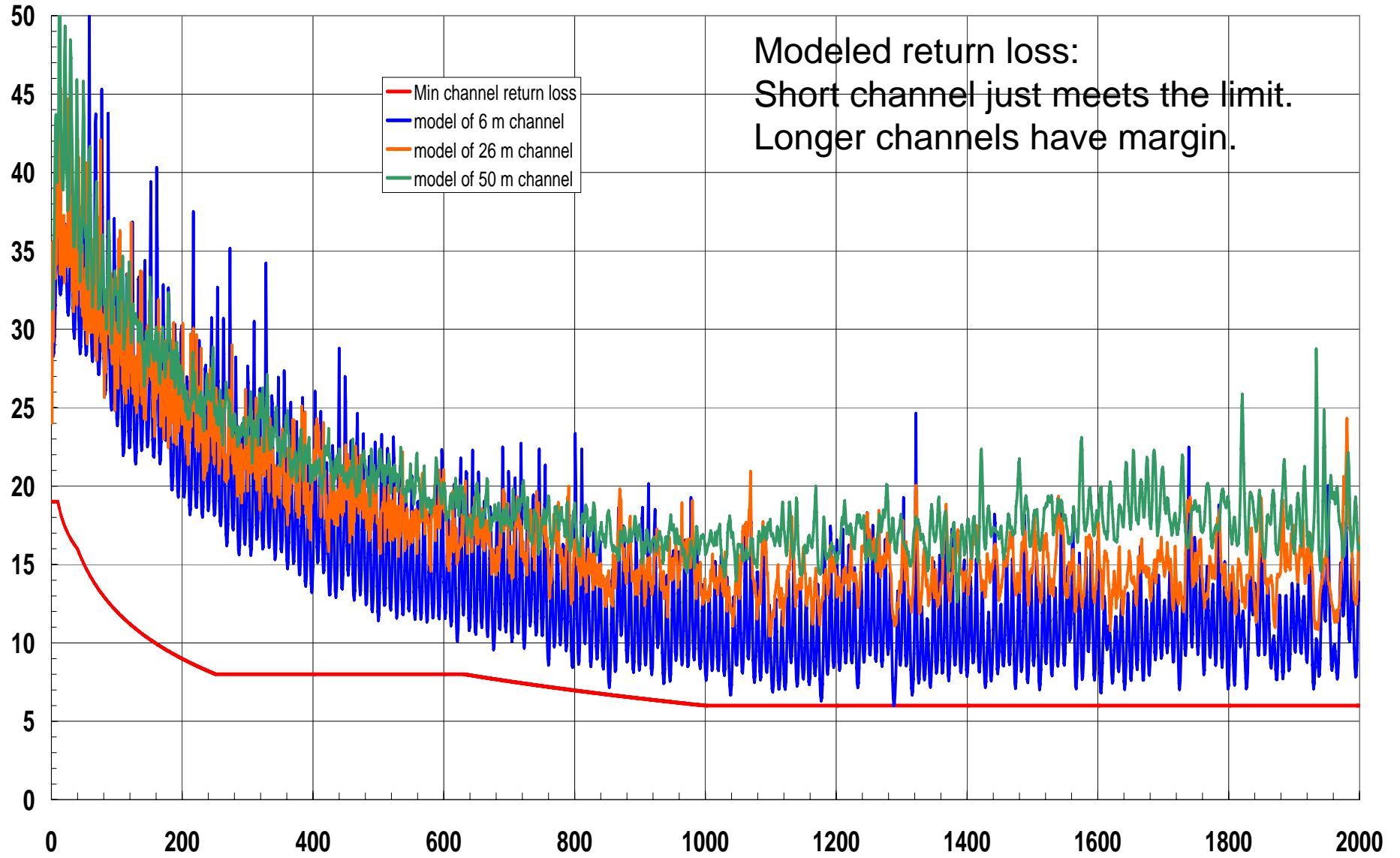


Insertion loss v length  
2 connector channel



return loss

2 connector channels



Modeled return loss:  
Short channel just meets the limit.  
Longer channels have margin.



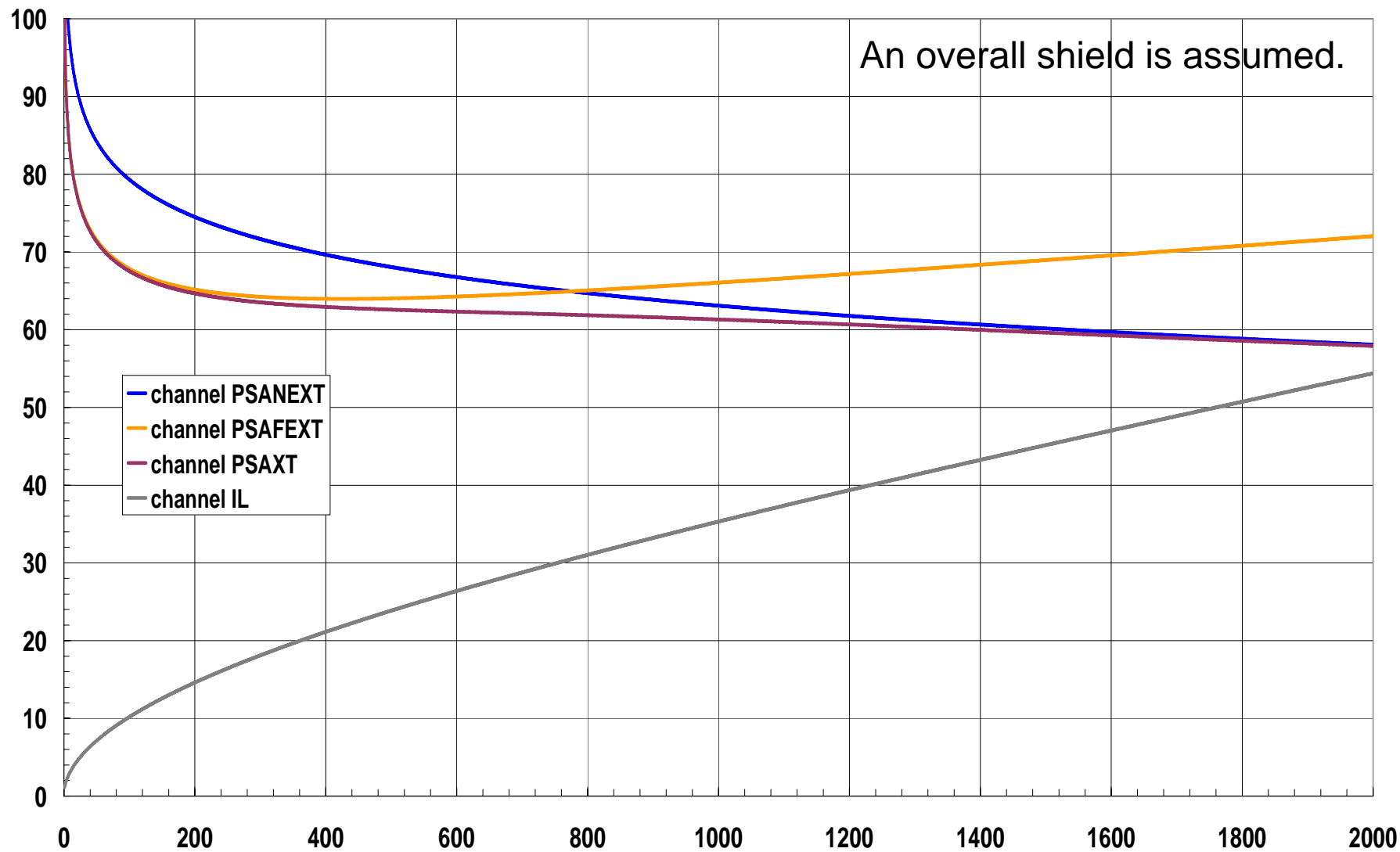
# Alien crosstalk

	Frequency (MHz)	PSANEXT loss (dB)
100Ω Next Generation	$1 \leq f < 100$	$80 - 10 \cdot \log(f/100)$ (TBD)
	$100 \leq f \leq 2000$	$80 - 15 \cdot \log(f/100)$ (TBD)

	Frequency (MHz)	PSAACRF (dB)
100Ω Next Generation	$1 \leq f \leq 2000$ (TBD)	$56 - 20 \log(f/100)$ (TBD)

These requirements are limited to a maximum of 75 dB.

Alien crosstalk - 50 m channel  
2 connector channels



# Questions and Issues

- What is the frequency range of interest?
- What is longest reach in meters?
- What is shortest reach of concern?
- Effects of 6 dB return loss in channel at high frequencies on short channels
- Establishment of alien crosstalk limits
- What are some other cabling parameters that are important to PHY designers?