Interferometric noise
– 1300 Serial –

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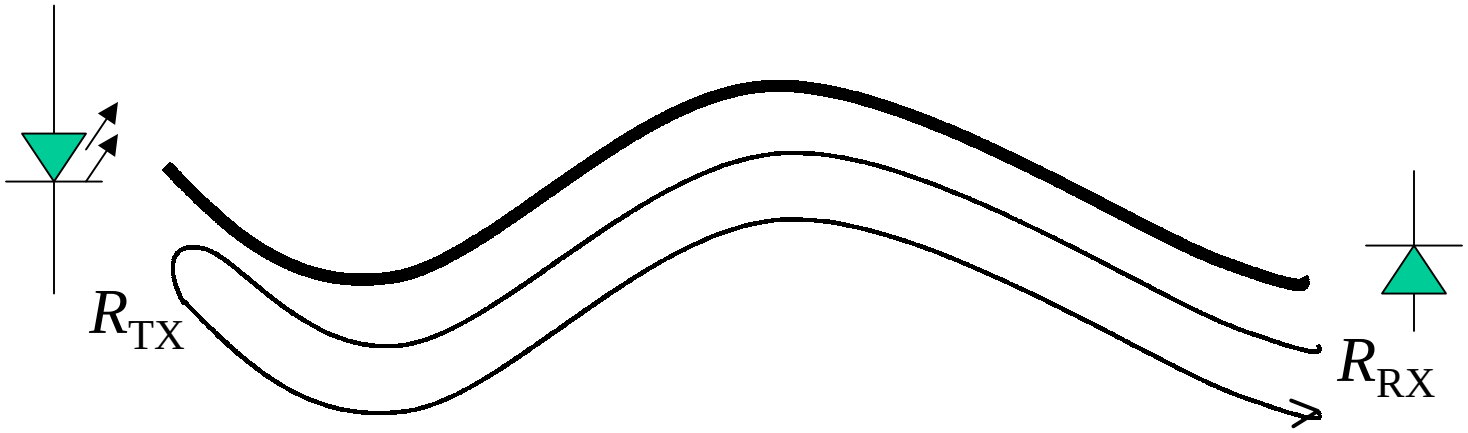
What is interferometric noise

- A delayed pulse from receiver, transceiver and connectors reflectors will interfere with the signal.



Coherence not really needed

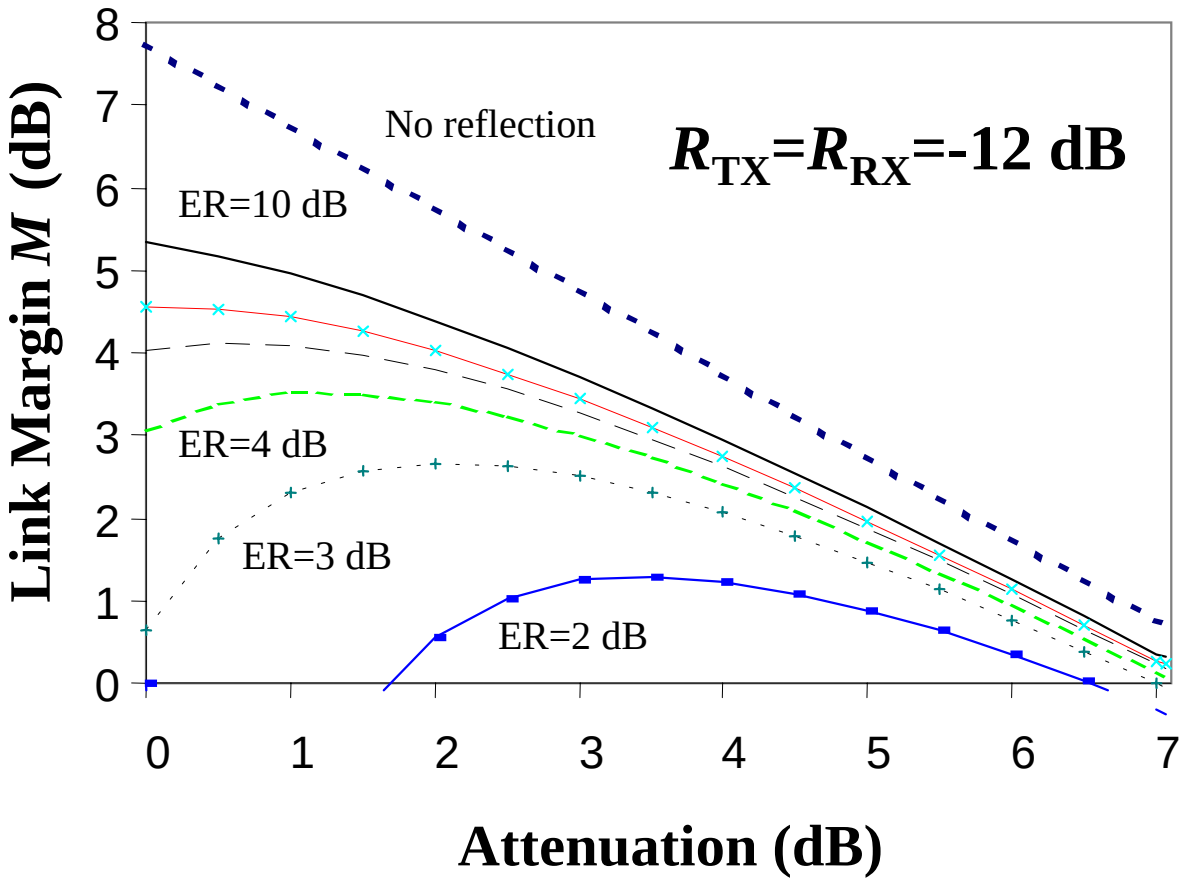
- If frequency difference between the direct signal and the reflected signal is below the receiver bandwidth, interference will be a problem.
- For 10 GE, this is very probable as 10 GHz=0.05 nm

Simple calculation

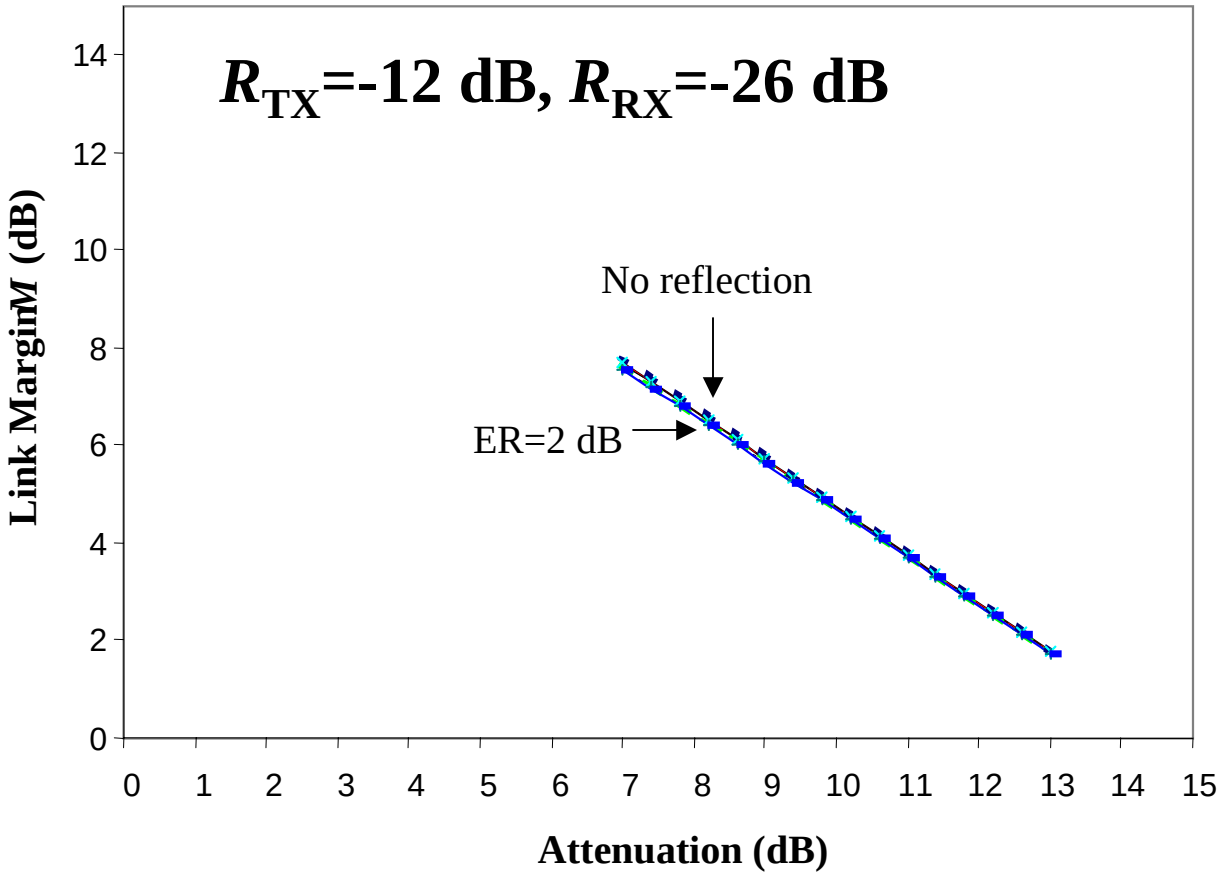
- Ignore connector reflections and higher order reflections.
- Document and spreadsheet on
  www.ieee802.org/3/ae/public/adhoc/serial_pmd/documents/
- NOT really worst case (explained later)

$$P_Q = A\frac{OMA_{TX}}{2}\delta\left[1-2A\sqrt{R_{RX}R_{TX}}\,\frac{\sqrt{2ER\left[\delta(ER-1)+ER+1\right]}}{\delta(ER-1)}\right]$$

1300 nm: results



1550 nm: results



To find really worst case

- Return loss of transmitter allowed to be worse than 12 dB
- Connector reflection must be included: 12 dB and 26 dB generate up to 10.4 dB with interference
- Overshoot in signal possible
- Base-line wander due to interferometric noise

What to do about 1300 nm serial

- At least 20 dB return loss for both Rx and TX, ER min 3 dB